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## THE RELATIONS OF GYNECOLOGY TO GENERAL SURGERY, PAST AND PRESENT *


HOWARD W. LONGYEAR, M.D.

DETROIT


The following more or less desultory and somewhat reminiscent remarks, on which I ask your kind indulgence, are given not for any exact historical value which they may contain, but more as a sort of reminder, lest we forget.

As I began the study of medicine while the development of the science of gynecology as a specialty was in its infancy, and that of abdominal surgery practically in the stage of incubation, and as I have had the opportunity of over forty years of observation, as a physician, to note the many brilliant achievements not only of the fathers of our specialty, but also of many of their successors, and to observe as well, during this time, the relative and comparative running capacity (to use a sporting term) between the gynecologist and the general surgeon, it would seem well in this day of Prussianistic surgery that I should consider a few of the alphas of success, and perhaps to attempt a little in the line of prognostication regarding the trend of surgical thought and practice toward the omega of relationship between the gynecologist and the surgeon.

My early professional training was conducted in the surgical atmosphere surrounding such men as J. Marion Sims, Thomas Addis Emmett, T. Gaillard Thomas, Willard Parker, T. M. Markoe, James R. Wood, Lewis A. Sayre, and others of lesser note in this country, and Schroeder, Martin and Langenbeck of Berlin, Billroth of Vienna, and Tait of England. Having come into personal contact, as a pupil, with some of these early masters, I can realize, after this lapse of time, how profoundly their influence has tended to shape the destinies of the present.

In any discussion of this or kindred subjects, we must not forget to consider certain of Nature's laws — those silent, ever active, immutable forces. These well known and generally accepted principles which automatically govern the development of the various species in the animal kingdom, which we are taught to term evolution, survival of the fittest, struggle for existence, etc., proceed with their accustomed steam-roller efficiency in other affairs of the genus *Homo* beside that which pertains to the development of the species.

The twentieth century is ushering in a period of kaleidoscopic changes, of Aladdin-like transformations in everything pertaining to the activities of man. Science, the arts, business, society, finance, methods of warfare — all are feeling the jolts of the erratic and rapid pace of this great evolutionary present-day thrust. We are living in a new world in which habits and customs, venerated by centuries of usage, are dropped without ceremony and without apparent effort or regret, and the new is blithely taken on, all in the name of progress. The horse bids fair, soon, to become extinct as a domestic animal, perhaps to revert to the wild state of his ancestors, and be captured and exhibited by future generations of man, as a curiosity, along with the gnu, zebra and giraffe.

The air has been conquered and space annihilated on land, in and on the water and in the air; previously impregnable fortresses and strongholds are now quickly wiped out by the touch of science. The once preposterous, imaginary creations of Jules Verne, considered only as romantic and interesting fiction, are now materialized, and the resultant steel monsters threaten the destruction of a world's commerce. Government of the most autocratic form, founded on centuries of despotic power, now vanishes in a night, to be swiftly and peacefully succeeded by liberal democracy.

In finance the numbers soar higher and higher until the common consideration of the most fabulous sums ceases to awe the beholder. Efficiency is now the watchword of education. In mechanics, handwork is replaced by the machine-made. Everything is manufactured in great numbers, with duplicate interchangeable parts. Similar kinds of manufacturing business are combined under one head, resulting in more economic production and better goods. This results in small business remaining small or going to the wall. The same spirit of big business is permeating the medical profession, as witness the elimination of the family doctor and the advent of the "group medicine" idea. Especially is this change true of the practice of surgery. A German physician, on visiting one of our greatest surgical centers, characterized it as *eine grosse chirurgische Fabrik*. Truly a surgical factory — a factory in which the product is turned out in immense quantity and also of good quality.

### PLACE OF THE GYNECOLOGIST IN SURGERY

Is it not time that we ask what place, if any, the gynecologist has, or will have, in the near future, in the field of surgery, and will these various surgical manufacturing industries that are endeavoring to emulate the *Fabrik* spoken of by the German physician have a place for the woman's doctor, or will the general surgeon be the whole "factory"? The general surgeon is, octopus-like, progressively absorbing more and more of the surgical specialties: As soon as one is perfected, he takes it over, and this policy of adap-

* Chairman's address, read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

tation will no doubt continue. The tonsils and adenoids, the pleural cavity, the perineum and cervix, the uterus and adnexa are now his. The abdomen and pelvis were presented to him by the gynecologic pioneers, and were quickly absorbed as soon as their operative technic was perfected. While in his abdominal work he may now be said to have "arrived," his gynecologic efforts frequently exhibit a hesitant and unfamiliar technic.

What did the general surgeon of the time of Sims, Emmett, Thomas and Tait know, or even care, about gynecology? Gynecology was carefully avoided by the surgeons of that day, and its practice outside of the recognized medical centers was usually relegated to the family physician, whose greatest pride was often manifested by the ability to introduce a bivalve speculum, and whose therapeutics began and ended in the use of tincture of iodin and the glycerin tampon.

This certainly was the gynecologic status in a general hospital of which I was house physician and superintendent for three and a half years of my early professional life, and from my knowledge of other hospitals of that time, I think the picture is not overdrawn.

From this work, which the surgeon of that day scorned, the gynecologist built up and perfected the system of surgery of the female genitalia, and from that upward, progressively, the surgery of the pelvic and abdominal cavities, which forms not only the basis but the whole superstructure of that work today.

The gynecologist was the pioneer in all of this great surgical specialty evolution. The general surgeon was his follower. Whether he shall now become, in turn, the master and the gynecologist the follower (or possibly only an onlooker) will no doubt be relentlessly determined by the before-mentioned natural laws.

The hospital previously referred to (Harper Hospital of Detroit) now grinds out an average of over thirty surgical operations a day. Comparative statistics from its records are interesting as illustrating the point just made. During the year 1897 (a year taken at random, twenty years ago) 709 operations, of which 360 were abdominal sections, were performed by gynecologists and general surgeons. Of the abdominal sections, 304 were made by gynecologists and 56 by general surgeons — about 84 per cent. for the gynecologists and 16 per cent. for the general surgeons. The same statistics for the year ending Dec. 31, 1916, are given in the accompanying tabulation.

OPERATIONS AT HARPER HOSPITAL IN 1916

| | No. | Per Cent. |
|---|---|---|
| Surgical operations made by general surgeons and gynecologists | 4,412 | .... |
| Abdominal sections | 2,652 | .... |
| Made by gynecologists | 384 | 14.5 |
| Made by general surgeons | 2,268 | 85.5 |

It will thus be seen that in the abdominal work the tables have been completely turned during the last twenty years. It will also be noted, if this exhibit is a fair average of the general surgeon's work everywhere, that he is now doing more abdominal work than all of his other work combined, so that if the average of abdominal work over general surgery continues to increase for the next twenty years as it has for the last two decades, it requires little mathematical calculation to figure the general surgeon out of everything but his abdominal work. Another of Nature's laws to be vindicated, perhaps!

If the gynecologist is thus shown to be no longer the predominating factor in abdominal surgery, what will be his position in the evolutionary processes twenty years hence? Will he pick up the bones cast aside by the general surgeon, in his lust for the peritoneum, and go on his way rejoicing, himself in turn becoming a general surgeon or will he be driven into the vast and prolific field of obstetrics — untouched, as yet, by the tentacles of the octopus?

For this popularizing of the operation of abdominal section with its present-day success, attending the work of many surgeons, the general adoption of two essentials in technic is responsible, in my opinion. I refer to asepsis, and treatment of the pedicle by the absorbable ligature. From the period of Lister's first teaching that it was something pathogenic that entered the peritoneal cavity through the wound during the operation, and not trauma of the peritoneum, which caused postoperative peritonitis, up to the finished evolution of the present method of absolute cleanliness and asepticism, the road has not been smooth and unobstructed, as we all know. Those of us who have operated in a room foggy with phenol spray, and used strong antiseptics to kill the germs on the instruments, hands and dressings, those who used enormously strong silk ligatures, which in some cases were left long, with the wound open, so that the knot could be withdrawn when the stump of the pedicle sloughed, those who used horrible clamps to get away from the ligature, and saw patients die, or struggle through a weary convalescence, can best appreciate the standard methods of today — the methods which make it possible for the general surgeon to do this work as commonly as the more ordinary operations of the past. It seems but a short and natural step from Ephraim McDowell's buckskin ligature, used in the first ovariotomy, to the catgut of today, but it took a long time, much experimentation and the cost of many lives to learn this one simple detail of technic.

## THE DEVELOPMENT OF ABDOMINAL SURGERY

In the foundation of the development of the operation of abdominal section, humanity and the medical profession are greatly indebted to a gynecologist. Lawson Tait, though much maligned and criticized by the surgeons of his day, not only threw brilliant light on the pathology of the pelvic organs, but also contributed a technic that is not only practical today, but has made possible other surgical procedures within the peritoneal cavity. I believe his success was largely owing to boldness in attacking adhesions, especially those occurring in connection with pyosalpinx, the pathology of which he was the first to elucidate clearly. To illustrate the uncertain attitude of surgeons in respect to pelvic adhesions: At about the year 1890, finding my pelvic work hampered by a fear of these adhesions, I asked a well-known gynecologist how he treated them. He said if he could not break them up by the force exerted, by spreading apart the index and middle fingers, he let them alone. Shortly after this time I visited Mr. Tait in Birmingham, and while assisting at a difficult salpingectomy I asked him the same question. His answer was quite different and well worth the cost of the European trip. He said: "A man without a good forearm better not undertake it."

In my opinion Tait did much to popularize the split-flap method of perineorrhaphy, which has now, justly, almost completely supplanted that of superfi-

cial denudation. Tait, like most pioneers, was wont to go straight to the root of things. He paid little attention to what he considered unessential details — especially in the matter of cosmetic effects — passing them over with apparent unconcern, and aiming only at the solution of the fundamental surgical problems. His perineorrhaphy technic was unique and startling. He would proceed to the bedside of the patient who was already anesthetized and across the bed in the lithotomy position; then, sitting sidewise on a low ottoman by the bedside, a bunch of silkworm-gut sutures placed conveniently in his mouth (!) Sims angular scissors in one hand and a fully curved handled needle in the other, he operated practically without assistance, in from five to seven minutes' time. No painstaking dissection was made. From three to five deep incisions (according to second or third degree of rupture) with the sharp pointed scissors sufficed to lay open the tissues in the direction of the ruptured and retracted muscles and fascia; then with the other hand the large needle was passed, and the suture taken from the mouth and threaded with the hand holding the scissors. The sutures were placed so as to include all the tissues but the skin margins, which were left without further suturing.

While the technic described would offer much to criticize (although the method allowed good drainage in the event of very probable sepsis) the simplicity and effectiveness of the operation were evident at a glance. By it the ruptured and retracted tissues were reached and reunited, which made the demonstration a graphic revelation in surgical mechanics that left no doubt in the mind of the observer of the value of its fundamental principle.

Sims' operation for vesicovaginal fistula was an epoch-making procedure, as it probably had more influence than any other in placing the specialty of gynecology on a firm foundation. The technic as taught by Sims was at once accepted in this country and in Europe.

Not so readily, however, was Emmett's operation of trachelorrhaphy accepted abroad. While the pathology of the lacerated cervix uteri as taught by Emmett was quickly adopted, as was the operation in this country, it was amazing how long a time it took the surgeons of Europe to accept this valuable contribution to pathology and surgery.

I did a trachelorrhaphy, according to Emmett's method, in 1878, and yet, while pursuing my studies abroad during the years of 1879-1880, I found Martin of Berlin doing the Schroeder cervical amputation for lacerated cervix, and in London I saw a large ward full of women, all being treated for the same trouble, termed ulceration and degeneration of the cervix, by the application of potassium hydroxid.

The general surgeons of the time of Sims, Emmett and Thomas, many of whose names are now looked on as beacon lights of the profession, knew nothing, comparatively, of gynecologic surgery. Engrossed in their own absorbing and developmental work, they looked at first with amused curiosity at the achievements of the gynecologist.

The general surgeons of that day rarely undertook intra-abdominal work, and when they did it was usually in cases of far advanced ovarian cystomas. While otherwise skilful operators, they often presented sorry spectacles of surgical impotence in operations involving the abdominal cavity. They exemplified unpreparedness, and while more dramatic, were less seriously accurate than their brothers of today.

Those of us who had the good fortune to be under the tutelage of some of those really great men can appreciate the truth of this observation. Think of the clinic of the late James R. Wood being used to demonstrate an abdominal section! He was familiarly and affectionately known as "Jimmy" Wood, and his clinic was termed "the matinee." His methods were the epitome of those of the great surgeons of that day. Rapidity and accuracy we admit were there, but above all was the spirit of dash and theatrical display that seemed to form a necessary part of the equipment of the great surgeon.

The gynecologist took himself more seriously, as his manifest destiny demanded, as he was the instrument being prepared for the accomplishment of the great surgical victories over the pathology of the pelvis and abdomen. Such a destiny could be achieved only by the serious-minded and prayerful. Also the plastic work of the vagina and cervix, the repairing of vesical and rectal fistulas, shortening of the round ligament, and other work approaching in delicacy the surgery of the eye offered no opportunity for theatricals.

From the pathology of the perineum, vagina and uterus it would seem but a step, to be quickly taken, to that of the fallopian tubes and ovaries; but owing to the dangers attending the invasion of the peritoneal cavity, this advance was not possible in any practical way until the principle of asepticism became known. Tait then boldly entered this new field with its immense possibilities, this previously unexplored region, whose gonococcus-infected tubes and ovaries were destroying the health, happiness and lives of untold numbers of women.

The younger generation in the profession, who have grown up in the atmosphere of modern pathology, can with difficulty realize the value of the boon to womankind that followed the discovery of the etiology of the pus tube.

Old textbooks on gynecology, written from thirty-five to forty years ago, treat voluminously of pelvic cellulitis, but not at all of pyosalpinx. The treatment was practically by the use of the hot vaginal douche. It is well occasionally to take a retrospective view that we may better appreciate the advantages of the present.

Ectopic pregnancy, also, was not well understood until after the advent of aseptic surgery. Pelvic hematocele was discussed at length in the same textbooks, and extra-uterine pregnancy was passed over with little more than mention of its rarity. Tait's brilliant work elucidated this subject. As early as 1876 he advised operation in such cases.

The modern aggressive surgery of the vermiform appendix began soon after the latter date, and here is also seen the influence of Tait and his followers, many of the latter, like the late lamented Joseph Price, carrying on the work with great energy in this country.

While Willard Parker of New York advocated and practiced the drainage of appendical abscesses as early as 1867, and reported a number of successful cases, and while many others were working along the same lines, especially in this country, it is again largely to Tait's wonderful pathologic insight, surgical skill and incisive boldness that we must credit much of the present successful operation of appen-

dectomy. It was in 1881 that he uttered the startling dictum of abdominal section for all cases of peritonitis from whatever cause occurring.

This seemed radical, a far cry from the heroic opium treatment of Alonzo Clark and his followers, which was in full swing as late as 1875; but the light was just commencing to be turned on the pathology of this time-obscured *terra incognita* — the peritoneal cavity — and the commanding personality of a Tait was necessary to push home the new truths in a clear and forceful manner.

As regards extra-uterine pregnancy, Strahan,[1] writing in 1889, said that Lawson Tait had had more experience of such cases than any man living and more than any man who ever lived. Tait had then reported seventy-six cases, and had published a brochure[2] which embraces practically the views which are held on the subject at the present time. Following the lead of these pioneers in gynecology and abdominal surgery, we find the names of many surgeons of brilliant attainments whose wonderful skill in diagnosis and technic are marvels of scientific acumen. But the old pathfinders are gone, it is hoped to their much merited reward. Many of their immediate followers who pushed the work initiated by these early discoveries to a successful fruition have also passed to the other side, but their work has resulted in such a standardization of the original fundamental principles pertaining to pelvic and abdominal pathology and surgical technic that these once seemingly impossible and unapproachable problems are now open to successful solution, by the skilful and conscientious surgeon. And right here lies the danger to the public. Skilful surgeons may not all be conscientious; conscientious surgeons may not all be skilful.

### DEVELOPMENT OF THE SPECIALIST

The present day free dissemination of knowledge by innumerable, lavishly illustrated textbooks results in the ruination of many good embryo internists in fashioning mediocre surgeons. The lure of the knife is an *ignis fatuus* to many would-be surgeons. It all looks too easy and simple, on paper. Self-styled surgeons have been made too quickly in this country, and when time and experience have turned out a few good ones from this number, it has been at a stupendous cost of health and life to the public.

Much good surgical timber is spoiled by the spreading out of endeavor over too wide a territory, when concentration over a much smaller area would mean success. Preeminence has rarely been achieved by the former process, and it will ever be thus until those evolutionary processes of Nature produce the superman. With the younger generation of surgeons it would seem as though some of them believed the era of the superman had arrived. The pendulum is certainly swinging in the direction of all varieties of surgery for the general surgeon, and this will no doubt go on until the spreading out process will become so thin a surgical veneer as to determine the reverse swing of the pendulum.

Will the specialist, then, come into his own by a sort of process of vicious circle action, engendered by the rapacity of the octopus, or is this simply an evolutionary process of Nature, who, in her wisdom, is working out a higher and more dignified and more impregnable position for the specialist? We may be sure that, at this period of medical history, with its continuously higher educational requirements, the law of the survival of the fittest will determine the destiny of all concerned in this contest.

The influence of the American College of Surgeons will soon be felt in this direction in its efforts at the standardization of surgery and surgeons. This field could be possibly still farther broadened, and the beneficent usefulness of the College enhanced, by extending such standardization to the surgical specialties. It would seem that the power of arbitration so exercised would fill a long felt want in the elimination of those with little or no qualifications for the work in which they propose to specialize. The demand for the best surgery is soon to be made by both the physician and the people, as they are awakening to the fact that the performance of a great multiplicity of operations of all kinds by a surgeon does not necessarily constitute him a skilful operator or a person of sound judgment.

To make the specialist of the future, many of the short cuts now taken so easily toward the goal will be closed, and only that road — the one containing all the "jumps" — which leads to the greatest proficiency will be left open. The future surgical specialist will not be a person of narrow medical education, professing or knowing nothing outside of his chosen field. He will be a doctor of broad medical and surgical knowledge, of which his chosen specialty will be as the keystone of an arch, placed last, holding all and held by all.

The prospective specialist, after receiving his medical degree, should be required to take a hospital course in internal medicine, in which he must become proficient, and especially so in differential diagnosis. This will be his most valuable preparation for future like work, although it is now usually looked on as drudgery, to be avoided if possible, by the candidate for the hoped-for surgical distinction. It is here he will learn those points of diagnosis which will save him from making many operative blunders; such, for instance, as taking out appendixes because of pain caused by a spastic cecum, stone or "gravel" in the right ureter, or by pneumonia — mistakes made too frequently at the present day. He will then be prepared to take the hospital course in surgery, which should be general surgery, in the broadest sense of the term, as in my opinion it will be only the operator who has been well grounded in all of the principles and practices of general surgery who should be allowed to attempt a surgical specialty of any kind. The latter should be looked on as a sort of postgraduate professional accomplishment, to be attained by merit, as a soldier wins his spurs. After the course in general surgery he will be prepared to begin the serious study of his chosen specialty. This should be under the direction of, and while acting as the assistant to, a surgeon practicing such specialty. Such a term, consisting largely of practical assistance in operations, should extend over at least one year.

A specialist commencing his life work after such preparation would command respect, and the lives of the public would not be endangered, as at present, by the ignorant and venal self-seeker.

### SUMMARY

I believe that the gynecologist and abdominal surgeon, as a specialist, has seen and passed the zenith

1. Strahan: Diagnosis and Treatment of Extra-Uterine Pregnancy.
2. Tait: Scheme of Ectopic Gestation in Tubo-Ovarian Tract, Lancet, London, Sept. 1, 1888.

of his activity, under present conditions; that the future promises a still greater position than that enjoyed in the past, but that it must be attained by means of a broader education and through the medium of general surgery of the highest order and broadest understanding. I believe that the general surgeon of today is doing the major part of the abdominal and pelvic work because he is a better general surgeon than the gynecologist. It is this broad understanding of surgical problems in general that begets confidence, and confidence begets patients, and patients beget patients!

The surgical millenium has not yet arrived, but when it does the lion and the lamb will be seen lying down together, side by side, and not the one in the relation of nutritive pabulum to the digestive processes of the other.

700 Shurly Building.

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## REPORT OF STUDIES CONCERNING ACUTE LOBAR PNEUMONIA*

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Four years ago, before this section, I discussed the question of the treatment of pneumonia by means of specific serum, and gave the results of the treatment of a few cases by this method. (During the period which has elapsed since then, the study of this form of treatment has been continued, further experience has been obtained and certain new facts elicited, and today I desire to report the progress that has been made and to discuss certain practical questions relating to this form of therapy.) At that time the type of pneumococci causing the infection had been determined in only seventy-nine cases. We have now determined the type of infecting organism in over 500 cases in the Hospital of the Rockefeller Institute alone, and the method of determination of type is now being done as a routine procedure in a large number of hospitals and by several state and city boards of health.

Judging from our own experience, about one third of the cases of pneumonia are due to infection with Type I pneumococci, one third to Type II pneumococci, 10 to 15 per cent. to Type III pneumococci, and the remainder are due to infection with pneumococci belonging in the IV group. In small series of cases the relative numbers of cases due to the different types will, of course, vary, and they may vary somewhat in different cities and in different years. Our own figures from year to year, however, have been fairly consistent, and the results obtained by others have not varied widely from those stated. The observations which have now been made concerning mortality indicate that the cases due to Type I and Type II are of average severity, the mortality being from 25 to 30 per cent.; those due to Type III are severe, one half or more of the patients dying, while the cases due to organisms of Group IV are milder and the mortality is usually not more than 10 to 15 per cent.

These observations in regard to severity of the cases due to the different types of infection have proved of great value in prognosis. When the knowledge thus gained is combined with the knowledge obtained by blood culture, and by testing the urine for precipitable substance, we have a great deal of information regarding the probable outcome in the individual case. In the cases due to the more serious types of infection, a high grade of blood infection as shown by the number of colonies per cubic centimeter in the blood plates is of very bad omen. A heavy precipitin reaction in the urine also indicates a probable bad outcome, as Dochez and Avery have shown. These signs may already be present when the patient's condition is relatively good as indicated by ordinary clinical observations and tests. These facts have been of considerable importance in the past and will undoubtedly be of still greater value in the future in judging of the efficacy of therapeutic procedures.

At the time my previous paper on serum therapy was read, only a small number of cases due to Type II infection had been treated with serum, and no evidence could be presented which was of much importance in indicating its value. Further studies have not shown that this serum as now prepared and applied is of great value in the treatment of these cases. In the cases so far treated, no constant technic has been applied, as we have been earnestly searching for modifications of the method which would increase the value of the serum. Judging from the results in the individual cases so far treated, however, no definite marked modification in the course of the disease or in the mortality in this class of cases has been obtained. Nor has it been possible so far to modify the method of immunization in horses so as to obtain a more active serum.

As regards the serum treatment of cases due to Type I infection, however, further observations have confirmed the results obtained in the previous small series of cases, and the evidence now seems quite convincing that immune serum, rightly employed, in this form of infection is of distinct value, and by its use the mortality in patients infected with this type of pneumococci may be materially reduced. Up to the present 105 cases of this type have been treated with serum in the Hospital of the Rockefeller Institute alone, and of these, ninety-seven patients have recovered and eight have died. Of the eight fatal cases, three were treated only a few hours before death, late in the disease; one patient died on the sixteenth day of pulmonary embolism; one died on the fifty-fourth day, with a general streptococcus infection, following empyema; one at necropsy was found to have tuberculosis involving both lungs, with only a small area of pneumonia involving a part of one lobe. This leaves but two cases in which treatment may be said to have been at all adequately carried out, or in which any form of specific treatment could be expected to be of any value and these were treated late in the disease. One of these two patients died on the sixth day, after treatment on the fifth and sixth days, and one lived until the twelve day, treatment having been undertaken only on the seventh day. This patient had an extremely severe infection at the time of admission, blood cultures showing 300 colonies per cubic centimeter. In spite of this severe septicemia, the blood culture became negative, but the involvement was extensive, and in spite of treatment with massive doses of serum, he died on the twelfth day. Of thirty-five patients treated during the past winter only two have died.

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* From the Hospital of the Rockefeller Institute for Medical Research.
* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

The results of serum treatment in this series of cases have therefore been extremely good, and in many of the cases the clinical changes following the administration of the serum have been so definite and striking that it seems there can be little doubt of the effectiveness of serum treatment in this type of infection. Similar results have also been obtained in other hospitals where the treatment could be carried out with full attention to details. Craig and Nichols have also tested the method in a series of cases among the troops on the Texas border and among the Type I cases so treated the mortality was but 5 per cent.

These results, and the fact that certain public health laboratories and also certain commercial houses are now preparing the serum, so that there will soon be a considerable supply available, makes it evident that during the coming winter this form of therapy will be extensively employed in civil practice, and I hope in the Army as well. The latter is of much importance. During our Civil War twice as many deaths resulted from disease as from the injuries of battle. One half of all the deaths from disease were due to typhoid, dysentery and pneumonia. One of these diseases, typhoid, has now been practically eliminated, and it is not likely that dysentery will cause great damage in the present war. On the other hand, in the camps in which raw recruits are collected, especially in the winter, pneumonia is bound to be very prevalent. It is to be hoped that by systematic and thorough treatment of the Type I cases with serum, the mortality from this disease also may be materially reduced.

For these reasons I propose to discuss briefly certain practical points connected with this form of treatment.

Questions which are immediately raised are whether it is justifiable to treat all cases of pneumonia with serum, whether its use should be confined to cases known to be due to Type I infection, or whether it is justifiable to use a polyvalent serum in all cases of pneumonia. The objection to the use of Type I serum in all cases of pneumonia is that in at least two thirds of the cases we know that it will do no good whatever. The immunologic reactions of this infectious agent are absolutely specific. If we had no means of determining the type of infection in the individual case, we might discuss whether we were justified in subjecting two thirds of all pneumonia patients to the possibility of severe serum reactions without any possible benefit to themselves, in order to obtain good results in the other one third. Fortunately, we now have means for determining the type of infection in the individual case, and the fact that the method is somewhat complicated, though not extremely so, in my opinion does not justify the indiscriminate use of serum. It is impossible to say at present to what extent the serum reactions in the cases of other types might interfere with the chances of recovery, if at all; nevertheless they are unpleasant when they occur, and may cause some anxiety to the physician, especially if he be uncertain whether in the case being treated the serum can be of any value or not. There seems to be no reason, therefore, to change the opinion which we have previously held, that determination of the type of infecting agent should be an essential prelude to this form of therapy.

The same statements apply to the use of so-called polyvalent serums. The only other type of pneumococcus infection in which, with our present knowledge, antipneumococcus serum can be of value is infection due to Type II pneumococci. The best serum we have been able to produce against this type of infection is of considerable lower potency than the Type I serum. We have tested all the other serums manufactured in this country and know that none of them have a higher titer than ours. Our results with treatment with this type of serum are still inconclusive. We, therefore, believe that at present the use of a polyvalent Type I and Type II serum is unjustified. The indiscriminate use of serums in cases in which the type of infection is undetermined will only lead to inefficient and improper use of the serum in the cases due to Type I infection, in which, if the treatment is carried out intensively and with confidence, beneficial results may be expected.

It has been suggested that to avoid the delay incident to the determination of type, a single dose of Type I serum should be given in every case. During the time elapsing before the administration of the second dose, the type of infecting agent may be determined, and if it be not Type I, no further serum need be given. Whether by this method the disadvantages incidental to serum reactions will outweigh the advantages of earlier administration of serum, we have at present no means of knowing. The decision in the individual case will have to depend on such circumstances as the day of the disease on which the patient is first seen, the severity of the infection, etc.

In all forms of serum therapy the earlier the serum is administered the greater the effectiveness. Experience has shown this to be of much importance in treatment with diphtheria antitoxic serum, and the time of administration is undoubtedly still more important with antibacterial serums, such as antipneumococcus serum. Pneumonia is the easiest of the acute infectious diseases to diagnose; the onset is usually violent, and except in the case of the extremely poor, a physician usually sees the patient early in the disease. With general recognition of the importance of early diagnosis of the disease and determination of the type of infection, in most cases knowledge of the nature of the infectious agent can be obtained within twenty-four, or at the most forty-eight hours after onset, and serum administration can be commenced at once. If this form of serum therapy is going to prove of great practical value, it is important for all laboratories to be prepared to furnish prompt and accurate diagnoses of type. This is coming to be recognized, and a number of public health laboratories are now prepared to carry out the required tests. In outlying country districts the matter is more difficult, but in any place that examinations of throat cultures for diphtheria bacilli can be made, the tests for determination of type of pneumococci can be performed.

After it has been determined that the case is one of pneumonia due to Type I pneumococci, the administration of serum should at once be made. It is not fair to the treatment or to the patient to wait to see whether the case is going to be a severe one or not. All experienced physicians know that nothing is more difficult than prognosis in pneumonia. With the laboratory aids we have mentioned, it is not infrequently possible to say, even in the absence of severe symptoms, that a case will progress badly, but it is next to impossible to say with any authority, early in the disease, that a patient will recover. All patients with Type I infection should, therefore, be treated with serum, and treated as soon as the diagnosis is made.

In administering serum, however, it is important to know that the serum is of proper strength and potency.

Last winter in testing antipneumococcus serums prepared by commercial houses I found that certain of them had little potency against pneumococci of Type I; some of them had absolutely no protective power against any type of pneumococcus with which I am acquainted. It has been somewhat difficult to determine a standard of potency for this form of serum, though not nearly so difficult as for antimeningitis or antidysentery serum, for instance. The Hygienic Laboratory of the United States Public Health Service has now taken up the matter and within a short time it is expected that a standard will be fixed. An effective serum will be one which is equal in potency to the standard serum, 0.2 c.c. of which protects a 20 gram mouse against 0.1 c.c. of a culture, of which 0.000001 c.c. alone will kill. As soon as this standard is established, those administering this form of serum should employ only such serums as are guaranteed by the manufacturer to conform to the required tests.

This serum should be given intravenously, preferably diluted once with freshly prepared sterile salt solution, though this dilution is not absolutely necessary, provided the serum be injected slowly enough. The dosage is at present empirical. For reasons into which I cannot enter here, however, we believe that the dose for an adult should be at least 75 to 100 c.c., and if necessary this should be repeated every six or eight hours until a favorable result is obtained. In most cases two or three doses are sufficient. The average amount employed in our cases during the past winter, if we except the one fatal case which was treated over a period of five days, has been 250 c.c. Usually within an hour or two following the injection, there occurs a slight elevation of temperature succeeded by a marked fall. Frequently, however, the temperature does not remain low, but after a period of from eight to twenty-four hours it again begins to rise. We feel that it is extremely important to watch the patient after the administration of serum, taking the temperature every two hours, and whenever this rise occurs the administration of serum should be repeated at once. If no change occurs following the first dose, the reinjection should always be made within six to eight hours. Experimental evidence as well as clinical observations indicate that we should persevere, even if no reaction is obtained after several doses.

The object to be striven for in the administration of the serum is to produce in the patient's blood a concentration of antibodies such as that which occurs during natural recovery from the disease, for we believe that it is largely on this factor that recovery depends. If to obtain this result required merely the addition of a definite amount of the serum to the patient's blood, just as we might make a dilution of the serum in normal blood in the test-tube, there would be little difficulty, for the serum is of high potency and it is probably only necessary to produce a slight concentration of immune bodies in the patient's blood in order to obtain favorable results. However, experiments have shown that not only do the bacteria circulating in the blood fix antibodies and so render them ineffective, but in the infected patients the blood contains soluble antigenic substances which fix antibodies just as do the bacteria themselves. In the severely infected patients these soluble substances may be present in large amounts and it is only after these substances are all saturated that an effective concentration of immune bodies in the blood can be obtained. This fact explains why, in the severely infected or late cases, it is necessary to inject so much more serum than it is when the patients are seen early or are less severely infected.

In administering large amounts of foreign serum, as it is necessary to do in this form of therapy, the patients may exhibit certain symptoms which are due entirely to the parenteral injection of the foreign protein, and have no relation at all to the content of the serum in specific antibodies. The physician should be familiar with these reactions, in order that they may be avoided so far as possible and that appropriate treatment may be given, and finally that he may not be unduly alarmed and avoid employing a measure which is of such distinct advantage to the patient. These so-called serum reactions are of several kinds. First, in patients who have previously received horse serum, or even occasionally in cases in which no history of the previous administration of horse serum can be obtained, there may occur, almost immediately following the injection, suffusion of the face, restlessness, increased heart rate, difficulty in breathing, urticaria, and rarely collapse. These symptoms may occur, however, after the administration of small doses of serum such as are employed in the treatment of diphtheria, as well as following large doses of serum such as are required in pneumonia. The reaction is undoubtedly analogous to, and probably in principle identical with, the so-called anaphylactic shock seen in animals following a second injection of foreign protein. That it is not of frequent occurrence and is rarely of serious import all those who have had much experience in giving diphtheria antitoxin will bear witness. Moreover, it can be guarded against and probably avoided in all cases. In the first place, we now have means of determining before administration of serum or protein whether or not a patient is sensitive. This is done by injecting into the patient's skin, not subcutaneously, a small amount of the foreign substance. If the patient is sensitive, within an hour there will occur a characteristic local edema and erythema, which is entirely lacking at the site of injection in patients who are not sensitive. It is, therefore, important that this test should be made before giving horse serum, and this applies to all forms of serum therapy. Second, it has been shown by Besredka and others that even susceptible and highly sensitized animals may be completely desensitized so that they may receive huge doses of the serum to which they are sensitive, if the injection be made gradually, beginning with an extremely minute dose, and following this with doses of gradually increasing size. It has been shown that even administering the serum with extreme slowness may be sufficient to prevent anaphylactic shock in animals. It has been our plan, therefore, to inject subcutaneously into every patient suffering from pneumonia, on admission to the hospital, a small dose, 0.5 to 1 c.c., of horse serum. This is done, even when the skin reaction has not shown that he is sensitive. By this measure, if slight grades of sensitization be present, several hours will have elapsed by the time the determination of type is made, and in the meantime the patient will have been desensitized. Then in administering the serum, it is injected slowly at first. A good rule is to allow at least fifteen minutes for the administration of the first 15 c.c. If no reaction has occurred, the remainder may be injected more rapidly, and subsequent doses may be injected without this delay. If the skin test has shown the patient to be sensitive, additional measures to desensitize the patient should be taken in the

way of repeated injections, beginning with small doses and gradually increasing them. By these means Alexander, at the Peter Bent Brigham Hospital, has been able to treat safely and successfully pneumonia patients who have been known to be highly sensitive to horse serum. It should be noted that care should be taken in the serum treatment of patients suffering from asthma, hay-fever or other forms of protein sensitiveness, for it is known that such patients are especially liable to be sensitive to horse serum as well. If the physician has knowledge of all these facts, and takes adequate precautions, severe anaphylactic shock should not occur. In any case, it should be remembered that severe shock occurs extremely rarely. Its danger should not be overemphasized, and above all, serum treatment in cases in which it is known to be effective should not be omitted because of this possible danger.

The second form of serum reaction is more difficult to guard against. This possibly has nothing to do with anaphylaxis or previous sensitization, and may occur with repeated injections. The symptoms, however, are like those seen in anaphylactic shock, consisting of restlessness, tachycardia, suffusion of the face, sweating and occasionally vomiting. They may appear during the administration of serum, or may be delayed for an hour or longer. High elevation of temperature, with abrupt fall, may be a part of this nonspecific serum intoxication. This reaction is identical with that sometimes seen after salvarsan injections, which reactions are thought to be due to improperly distilled water. It is the same kind of reaction which is seen after large injections of vaccines, which reactions have been claimed by some to have therapeutic effects. However, we do not believe that the beneficial effects of such reactions have been demonstrated. So far as the present form of therapy is concerned, we believe that the occasional occurrence of such reactions is a distinct drawback to the method, and we believe that such reactions should be prevented so far as possible. At present they cannot be entirely avoided; an occasional patient will show such a reaction, just as they do with salvarsan. However, we can undoubtedly lessen the frequency of their occurrence and their severity. Certain lots of serum are more prone to produce such reactions. Those lots of serum should not be employed. Then the injections should be given slowly and the serum should be heated to body temperature before injection. If the patient shows signs of distress during the treatment, the injection should be stopped, to be continued an hour or two later. If such reactions occur, the injection of 0.5 c.c. of epinephrin solution, or 0.01 grain of atropin will usually give relief. While these reactions, when they occur, may appear alarming, so far as we have been able to see they have in no way affected the course of the disease or interfered with the efficiency of the serum.

Finally, following serum treatment, patients may show a complex of symptoms which has been described as serum sickness. These symptoms consist of elevation of temperature, skin rashes, glandular enlargement, edema of the skin, and joint pains. Mild symptoms, especially the skin rashes, may occur within a day or two after the serum injections (so-called accelerated reactions). The entire group of symptoms most frequently occurs, however, seven to fourteen days following the administration of the serum. The attack may be repeated one or more times, or may be very irregular in its course. Mild symptoms occur in about half the treated cases, severe attacks only rarely. While this so-called serum disease is at times distressing, it is, so far as I know, never serious, and is always recovered from, leaving no sequelae. The urticaria is the most distressing symptom. This may be relieved temporarily by the injection of small doses of epinephrin, and the discomfort may be lessened by phenol washes. It should always be remembered that during the entire period of convalescence the physician should always be watchful for complications. It is a very unsafe rule to ascribe all unusual symptoms during this period to serum sickness. Serum sickness may cause high elevation of temperature, to 103 F. or over, for instance, but care must always be taken to avoid overlooking other complications which may be responsible.

I have laid stress on these various symptoms following the administration of serum, because every physician carrying out this form of treatment should be familiar with them, and because the statement has been made that the danger of anaphylaxis is so great and the discomfort of the serum reactions so marked that serum therapy in pneumonia should not be employed. This point of view I believe to be entirely wrong. If in such a serious disease as pneumonia we have a measure which may save life, we have no right to neglect it because of the possibility of anaphylaxis, which can be avoided, or of serum reactions, which are at the most only distressing. The dangers associated with the administration of serum are probably no greater and probably much less than the danger associated with the administration of an anesthetic. We have now administered large doses of serum in 150 or more cases without seeing any unfavorable results.

We now have evidence that the treatment of cases of pneumonia due to Type I pneumococci with immune serum is of value in lessening the mortality from this disease. To produce the desired results it is extremely important that the disease be diagnosed early, that the type of infection be promptly determined, and that there occur no delay in administering the serum. The serum should be a specific one, of known high titer. It should be administered intravenously in large amounts. Finally, care should be taken to avoid anaphylactic shock, and the physician should be familiar with the different kinds of serum reactions, and, while he should try in every way to avoid them, he should in no case neglect the administration of serum because such reactions may occasionally occur.

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## ABSTRACT OF DISCUSSION

Dr. Lawrence Litchfield, Pittsburgh: During 1916 there were reported in Pittsburgh 1,394 cases of lobar pneumonia, while 1,296 deaths were certified to lobar pneumonia. The physicians of western Pennsylvania are learning the importance of differentiating their pneumonias according to the method of the Rockefeller Institute. We believe it is just as necessary to differentiate one type from another as it is to differentiate pneumonia from typhoid fever. It has been repeatedly shown that one type of pneumonia confers no immunity as regards other types. A patient convalescing from Group IV pneumonia, for example, may contract a Group I infection from a patient in a neighboring bed. Therefore, it is essential not only to differentiate the types of pneumonia, but to isolate them strictly from each other, as well as from other hospital patients.

Through the courtesy of Drs. Ernest W. Willetts, Oskar Klotz, S. L. Haythorn, C. C. Hartman, and A. B. Walgren, I

am able to report here practically all the cases differentiated in western Pennsylvania up to the present time. The results are shown in the table.

| | 134 Cases | | | |
|---|---|---|---|---|
| Types | Number | Per Cent. | Deaths | Mortality Per Cent. |
| I | 55 | 41 | 26 | 47 |
| I | 39 | 29 | 16 | 41 |
| III | 7 | 5 | 4 | 57 |
| IV | 33 | 25 | 16 | 48 |

Another striking evidence of the virulence of pneumonia in our district is the fact that out of these 134 cases there have been fourteen cases of pneumococcic meningitis diagnosed by lumbar puncture, of Type I, twelve cases; of Type II and Group IV, one case each. Some of these meningitis patients were treated by the repeated injection of the undiluted Rockefeller serum into the lumbar canal, the amount injected being the same as the amount of cerebrospinal fluid withdrawn. Fluid withdrawn after these treatments showed clumping and disintegration of the pneumococci from the effect of the serum. The symptoms and progress of the meningitis were modified in a noteworthy manner, but as yet we have had no recoveries.

Of the Type I cases of lobar pneumonia, twelve patients were treated with the Rockefeller serum, with five deaths. All were late cases and the patients were desperately ill; and in spite of the high mortality, a study of the cases has made me very enthusiastic as regards this treatment. In two cases we had somewhat alarming symptoms immediately following the injection of the serum—dyspnea, tachycardia, and cyanosis—but both patients recovered after the free use of digitalis, epinephrin and atropin, intravenously.

Sixteen cases of pneumonia, Types I and II, in which urine was tested for specific precipitins without concentration gave results as follows:

| | Positive | |
|---|---|---|
| Negative | Type I | Type II |
| 9 | 4 | 3 |

Six cases of Group IV tested against antipneumococcic serum Types I, II and III were all negative.

One case, Type I, marked precipitate before boiling, negative after.

One case, marked precipitate I and II at dilutions of 1 to 10, 1 to 20 and 1 to 40, and with Type II only at 1 to 80.

DR. DAVID BOVAIRD, New York [Dr. Bovaird gave on a chart results obtained at the Presbyterian Hospital]: There is a most remarkable variability in the mortality of the different groups of this disease in different years, a variability for which we have at present no explanation. In Group IV, in 1914, the mortality was 5 per cent.; in 1916 it was 25 per cent., and so on. It is also clear that in Group I the mortality is more nearly constant at about 25 per cent. It is, therefore, important to be careful in comparing mortality statistics. Thirty-three cases belong to Group I; we have treated twenty-seven patients with serum, and of these five died, a mortality of 18.5 per cent. In the entire chart there are 211 cases with a mortality of 30 per cent. in the whole group. Two of the five serum-treated patients died of empyema subsequent to their lobar pneumonia and did not, in a fair sense, die of pneumonia itself. A third died of systemic staphylococcus infection, the origin of which we cannot accurately determine; but it was a sequel of the pneumonia and not a part of the pneumonia itself. That case should be excluded in estimating the mortality of the group. In short, but two of the five deaths are justly to be regarded as serum failures, a mortality of 7.5 per cent.

Apart from the question of mortality, it is perfectly clear that there are some definite and immediate effects of the injection of the serum. In the first place, the reduction of the temperature comes within twenty-four to forty-eight hours. Coincident with the drop of temperature there is a marked improvement in the patient. In many cases that change is analogous to that which accompanies the real crisis of the disease. The duration of the disease seems to be shortened. The total duration of the cases in the serum-treated patients is less than that of the others. In patients with positive blood cultures, the bacteria disappear from the blood. In some patients the early reactions seem to be attended with danger. We have had no fatality which we could attribute to them. The late serum reaction is very uncomfortable to the patient and is to be reckoned with in treatment. The possibilities of these reactions demand that the serum be used only in the cases in which it is indicated. In the serum we have a remedy that is not miraculous, but which will produce definite therapeutic effects, and which has already reduced the mortality of the disease to some extent at least; all of which leads us to believe that the men who have brought forth this remedy should pursue these same lines and be able to yield us still more substantial results.

DR. S. J. MELTZER, New York: I wish to cite here an encouraging result which we obtained with the serum treatment of experimental pneumonia in dogs, produced by the method of intrabronchial insufflation. Dr. Wollstein is now in possession of a very virulent pneumococcus culture of Type I, by means of which we succeeded in producing typical pneumonia with a fatal termination. Only about a week ago we insufflated two dogs of the same size with similar doses of the culture. The nontreated animal died in less than forty-eight hours under severe clinical symptoms; the necropsy showed the presence of a severe pneumonic lesion. The other dog received four serum injections administered by Dr. Chickering. That animal is still alive and apparently well. Of course no definite conclusion can be drawn from a single experiment, but the contrast was so striking that the result may be designated as encouraging.

DR. H. A. CHRISTIAN, Boston: We treated with serum during the last winter at the Brigham Hospital fourteen patients with Group I pneumonia, and of the fourteen, two died; one died on the sixth day of convalescence from pulmonary embolism resulting from thrombosis of a vein in the leg; the other patient died in the course of the pneumonia. The patient was an alcoholic in delirium. The other patients all got well. Reaction was prompt and striking. We have treated three or four patients who were sensitive and had asthma during treatment. These were desensitized, and notwithstanding the asthma, all of them were treated with serum with success. It is a difficult thing to do, and those who have not seen a patient desensitized will have no idea of the seriousness of the condition. That is why care should be used in introducing the serum, giving it slowly and having the patient under careful observation during its administration. In one of these cases the skin test with horse serum on the skin of the forearm was negative. The other cases reacted and we were guided accordingly to great caution. In the one case the skin test showed the patient not sensitive to this test and yet the patient had asthma. That is a good reason for the slow introduction of the serum in all cases.

DR. RUFUS COLE, New York: To establish by statistical evidence the value of any therapeutic agent in lowering mortality requires much time and the accumulation of a very large number of cases. We all remember the difficulties which were encountered in deciding from statistical evidence the value of diphtheria antitoxin. We all recognize that judgment from statistical evidence is especially difficult in pneumonia. The evidence of other kinds, however, has been so striking and the mortality statistics, so far as obtained, so good that we cannot but feel hopeful that the treatment of this type of infection by immune serum is of distinct value. However good other kinds of evidence are, the final test must be as to whether patients with pneumonia are cured or not. The results of the experiment on the dog mentioned by Dr. Meltzer are striking, but of course the evidence from one experiment should not weigh heavily in our judgment. Such experiments on dogs will undoubtedly be of interest and value, because conditions in the dog more nearly resemble those seen in lobar pneumonia in man than do those which are present following infection in smaller animals. In neither case, however, are the conditions identical with acute lobar pneumonia in man, and the final test of value must come from the observation of patients.

As to variations in the relative number of cases due to the different types of organism occurring in different places and

at different times, this is to be expected. It will only be after a very large number of cases are observed that we can state with any degree of accuracy the percentage of cases due to the different types of organism. Our results from year to year, however, have been fairly consistent and the results obtained in other general hospitals have agreed fairly closely with ours.

The number of cases of meningitis observed by Dr. Litchfield is extraordinary. I shall be interested to learn whether in any of these cases serum had been administered before the onset of the meningitis. The experiments of Dr. Wadsworth and those of Dr. Bull show that animals partially immunized or inefficiently treated tend to develop local focal, rather than general, infections, and suggest that in the very serious cases which are not efficiently treated, such focal complications as empyema or meningitis may occur. This does not mean that empyema or other focal lesions occur more frequently in serum treated patients, but that patients who would otherwise die may be saved, to suffer from a focal lesion. To determine this, however, will require many more observations than we have made up to the present. In collecting statistics regarding the outcome of treated and untreated patients, I think we should always include all the patients dying, even though they die from complications not necessarily due to pneumococcus infections, and this I have done. After all, such complications would not occur and the patients would not die had they not suffered from pneumonia.

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# DILATED DUODENUM

## WITH ESPECIAL REFERENCE TO CHRONIC DUODENAL OBSTRUCTION IN VISCEROPTOSIS *

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The terminal portion of the duodenum passes behind the root of the mesentery and lies on the vertebral column and aorta. In the human being, because of his erect posture, this transverse part of the duodenum is more or less compressed by the mesentery and its contained superior mesenteric artery. In 1899, Albrecht[1] pointed out that this segment of the duodenum has, under normal conditions, not a round contour but a distinctly flattened circumference. Codman,[2] a few years ago, also emphasized this fact and presented casts of a number of duodenums showing definite evidence of compression.

This normal constriction of the duodenum may readily be increased by slight anatomic variations, or by certain pathologic conditions, up to the point of complete occlusion of the intestines. Albrecht not only demonstrated this normal constriction of the duodenum in the cadaver but showed that if a finger be introduced into the duodenum and at the same time gentle traction downward be made on the mesentery, the constriction becomes more distinct and very evident to the examining finger. It is obvious that when this pressure of the mesentery reaches a degree great enough to give more resistance to the muscular efforts of the duodenum than the closed pylorus, the condition becomes of pathologic significance. Albrecht, and afterward Connor,[3] showed on the cadaver that traction on the mesentery in the direction of the axis of the pelvis may produce obstruction in the duodenum which will be impervious to water under considerable pressure.

In many cases of visceroptosis conditions arise within the abdomen that are an exact counterpart of the experimentally induced constriction of Albrecht. With the small intestine lying altogether or chiefly in the pelvis, traction is made on the mesentery in just the direction needed to cause a more or less complete occlusion of the duodenum.

Certain contributing factors play a part in producing mesenteric ileus. The mesentery must not be too long, otherwise the small intestine is supported by the pelvic floor and no drag ensues. Then again, the duodenum is rendered much more liable to serious compression if there is any unusual prominence (lordosis) of the lumbar vertebrae (Schnitzler[4]). This increased lordosis was very evident in Case 1 of our series. A dilated cecum displaced in the pelvis was noted in five cases of chronic dilatation of the duodenum reported by Bloodgood.[5] "The distended cecum in the pelvis, the short mesentery of the ileum near the cecum, the demonstrable pull on the mesentery, the dilated duodenum appeared to be the essential pathologic features." Jordan,[6] who gives an excellent roentgenographic description of duodenal dilatation, looks on the mesenteric drag and subsequent duodenojejunal kinking as one of the complications of ileac stasis. "The last coils of the ileum are normally placed above the pelvis; if there be any marked delay in the passage of the ileal contents into the cecum, these last coils of the ileum become overloaded and fall into the pelvis. In falling they drag on the mesentery," etc.[7]

Our experience with chronic dilatation of the duodenum due to mesenteric obstruction embraces six cases. In the first patient the condition was recognized only at necropsy; in two instances the duodenal dilatation was demonstrated at operation, and the diagnosis in three cases was confirmed by Roentgen-ray examination. From the study of these patients we are certain that we have overlooked other instances of chronic mesenteric ileus and that, in general, the clinical manifestations of duodenojejunal kinking are frequently misinterpreted.

### REPORT OF CASES

CASE 1.—*Clinical Summary: Jaundice at onset of illness five years ago, followed by aching pain in upper right abdomen; became nervous, hypersensitive and overreligious; frequent nausea and vomiting past four months; obstinate constipation; progressive loss of weight and strength; lordosis and visceroptosis; no abdominal distention; acidosis; death; necropsy; dilated duodenum.*

Miss M. (5216), aged 20 years. Date: Oct. 17, 1914. Complaint: Vomiting, weakness and pain in upper right abdomen.

*History.*—Patient had occasional attacks of tonsillitis, no other acute infections; her general health was good. In 1909

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* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Albrecht: Virchows Arch. f. path. Anat., **156**, 285.
2. Codman: Boston Med. and Surg. Jour., 1908, **158**, 503.
3. Connor: Am. Jour. Med. Sc., 1907, **133**, 345.
4. Schnitzler: Wien. klin. Rundschau, 1895, **9**, 579, 593.
5. Bloodgood, J. C.: Dilatation of the Duodenum in Relation to Surgery of the Stomach and Colon, THE JOURNAL A. M. A., July 13, 1912, p. 117.
6. Jordan: Brit. Med. Jour., 1912, **1**, 1225.
7. Jordan's article is well illustrated with roentgenograms and tracings in the case of a woman with a hugely dilated duodenum. He also describes a vivid fluoroscopic picture, namely: "The duodenum was half as long again and more than double the width of a normal duodenum. For seven or eight minutes the duodenum was observed undergoing vigorous writhing contractions in a vain endeavor to force its contents into the jejunum through the kink at the duodenojejunal junction. After seven or eight minutes a very powerful contraction of the duodenum forced a large mass of bismuth emulsion through suddenly into the jejunum, and the bismuth forthwith began to course rapidly through the coils of the small intestine. . . . Fifteen hours after the bismuth meal the stomach and duodenum no longer contained any bismuth; the greater part of it was found to be in the lower coils of the ileum in the pelvis. The cecum also occupied the pelvis. . . . Twenty-seven hours after the bismuth meal there was still some bismuth at the lower end of the ileum, and the most advanced portion had reached the sigmoid. Thus the sojourn of the bismuth in the small intestine was more than three times the normal."

the patient had jaundice for two weeks with nausea but no pain. She had a recurrence one month later with the same symptoms and duration. Made a complete recovery but a few months later developed a pain in the upper right abdomen. This continued but was never acute or severe, described as an aching. Became very nervous and overreligious. In 1912 the patient discovered a lump in the right side of the abdomen (floating kidney?) and saw a surgeon who advised against operation. Her nervousness and abdominal discomfort increased. No history of any acute attacks of abdominal pain.

In June, 1914, patient began to suffer with frequent nausea and vomiting. The vomitus was always sour and contained a great deal of bile. (Relation of pain and vomiting to meals not stated.) No hematemesis. Bowels have been obstinately constipated. Progressive emaciation and weakness. No diarrhea or stomatitis.

*Examination.*—Physical examination was negative, except as follows: Cheeks were flushed; tongue red and bald; abdomen retracted; lordosis to such an extent that lumbar spine does not rest on the bed; both kidneys easily palpable; moderate diffuse abdominal tenderness; abdominal walls soft.

Neurologic examination negative except as follows: Patient appeared apathetic and depressed; knee jerks were not obtained.

Roentgen-ray plates of chest were negative for active tuberculosis. (The patient was too ill to undertake roentgenographic examination of gastro-intestinal tract).

Blood: White blood corpuscles 6,900. Hemoglobin 70 per cent. Polymorphonuclears 55 per cent. Small mononuclears 35 per cent. Large mononuclears and transitionals 8 per cent. Eosinophils 2 per cent. Negative for malaria. Morphologically negative.

Urine (catheterized): amber, acid, 1.020, albumin distinct trace, sugar 0, indican slightly increased, acetone present, diacetic acid present. Microscopically negative.

Gastric Analysis: Ewald test breakfast, removed in forty-five minutes, 200 c.c. expressed. Gross appearance: greenish fluid, finely divided bread particles, no visible blood, no excess of mucus, no evidence of stasis. Free hydrochloric acid 13, total acidity 24.

*Course.*—During the first week in hospital, temperature ranged from 98.2 to 99.4 F., pulse 70 to 100; remaining six days temperature 98.2 to 101 F., pulse 116 to 134. Almost constant nausea, frequent hiccups, occasional vomiting. Repeated stomach washings brought back greenish-brown fluid. On one occasion gastric lavage returned some castor oil given twenty hours previously. Solution of dextrose and bicarbonate of soda by bowel retained. Obstinate constipation, but stools were secured daily by enema and purgatives. Mind was perfectly clear. No abdominal distention. Marked prostration.

Oct. 30, 1914. Patient died at 8:15 p. m. In the past forty-eight hours has not vomited but has regurgitated small amounts of slightly colored fluid on three or four occasions. Yesterday she took and retained a little nourishment by mouth, and last night retained 8 ounces of magnesium citrate. Bowels moved twice today. Kidneys have been acting quite freely until today, when secretion became scanty. Urine has continued to show large amounts of acetone and diacetic acid. The abdomen has been uniformly retracted until today, when rather marked distention appeared. The past three days the patient complained of being unable to see or hear well. The cheeks have remained flushed and there has been no jaundice. Several days ago the mouth became red and inflamed and today she has had difficulty in swallowing.

The following opinions as to the nature of patient's illness were entertained by

(1) Family physician: Chronic cholecystitis.

(2) Consulting neurologist: "If you can exclude gallbladder disease, I think her emaciation and vomiting can be accounted for by hysteria."

(3) Consulting surgeon: No obstruction, no surgical lesion; some underlying toxemia, possibly pellagra.

(4) Medical attendant: Visceroptosis, persistent vomiting of undetermined origin, starvation, acidosis.

*Necropsy* (Dr. B. C. Willis).—This was performed two and one-half hours after death and was limited to the abdominal cavity. The peritoneum was everywhere smooth and glistening. The liver, gallbladder and ducts were normal. The pelvis, urinary bladder, appendix, kidneys and suprarenal glands were normal. The transverse colon and most of the small intestines were in the pelvis. The former was deeply injected and somewhat distended with gas. The small intestine was collapsed. The lower portion of the ileum contained some fluid. There were few small subserous hemorrhages on the walls of the jejunum. Passing upward, the lumen of the small intestine became smaller and smaller as the duodenum was approached. The duodenum just behind the mesentery of the small intestine was sharply kinked. The cephalad portion of the duodenum was greatly dilated (diameter 3 to 4 inches) and filled with gas but its walls were not injected. The stomach was moderately dilated and contained about a pint of dark fluid. The pylorus was patent.

Conclusion: "The dilatation of the duodenum in this case may be explained by two marked anatomic changes: First, the extreme lordosis; and second, the marked visceroptosis which caused the mesentery to partially occlude the last portion of the duodenum as it crossed the vertebral column."

CASE 2.—*Clinical Summary: Abdominal pain of five years' duration with suggestive ulcer syndrome; visceroptosis; pulmonary tuberculosis; operation showed chronic mesenteric ileus with dilated duodenum.*

Mrs. R. (6156), aged 37 years. Date: Nov. 1, 1915. Complaint: Abdominal pain.

*History.*—The past history has no special bearing on the present complaint. Average weight, 115 pounds. Present weight, 97½ pounds.

The patient had vague digestive disturbance some years ago with vomiting and abdominal pain with subsequent recovery. Had four attacks of acute abdominal pain, the first one seven years ago, last one two years ago. Dates the onset of her present illness five years ago when she began to suffer with pain similar to toothache in the epigastrium. It occurs every day and is more pronounced for a week or ten days preceding the menstrual periods. The pain bears a definite relation to meals, occurring three to four hours after eating and is always relieved by eating. It is especially troublesome about bedtime. The pain is located high in the epigastrium and radiates up into the chest and through to the back. There is some flatulence but no vomiting. Patient has frequent dull headache, sleeps very poorly and is nervous.

*Examination.*—Patient is an undernourished, sallow woman. Has signs of pulmonary tuberculosis in both upper lobes, more marked on the right. The abdomen shows signs of counterirritation in epigastrium. A general rigidity makes palpation unsatisfactory. Has rather marked tenderness in the epigastrium and beneath the right costal border where a typical gallbladder block is elicited. Blood, urine and gastric analysis are normal. The gastric contents contained much bile, no stasis. Clinical diagnosis lay between peptic ulcer and chronic cholecystitis.

*Operation* (Dr. A. M. Willis).—The gallbladder and stomach were negative. Appendix was slightly thickened. The duodenum was greatly dilated down to a point where it passed behind the mesentery. General enteroptosis. Appendix was removed and an attempt made to free the obstruction about the duodenum by widening the slit in the mesentery.

Seven months later patient had developed well-marked laryngeal tuberculosis but her abdominal symptoms were improved.

CASE 3.—*Clinical Summary: Recurring spells of indigestion for fifteen years with regurgitation of food; suggestive gallbladder syndrome; pulmonary tuberculosis; no definite visceroptosis; Roentgen-ray examination showed dilated duodenum with stasis.*

Mr. W. (6284), aged 43 years. Date: Jan. 4, 1916. Complaint: Stomach trouble.

*History.*—Patient had typhoid twenty-five years ago. Used whisky freely until two years ago. There is no history of venereal disease. Average weight, 150 pounds. Present weight, 124 pounds.

The present illness began fifteen years ago with recurring spells of indigestion, now becoming more frequent. He has become extremely nervous and apprehensive. There is no actual vomiting but the chief complaint is regurgitation of food twenty to thirty minutes after eating. There is no difficulty in swallowing. A good deal of sour stomach and flatulence. There is a history of two short attacks of severe cramp colic in the past year requiring morphin. In general, his indigestion is not characterized by pain. He says he spits up his food because it induces fulness in the stomach with pressure about the heart which makes him very nervous. Bowels are always constipated. Has no jaundice.

*Examination.*—Patient is sallow and poorly nourished. The chest shows signs of fairly extensive tuberculosis in the right upper and middle lobe with some involvement at the left apex. The abdomen is entirely negative except for rather pronounced general rigidity. There is no localized tenderness. There are no masses and no free fluid. The blood and urine are negative. Gastric analysis by the fractional method showed moderate hyperacidity.

Roentgenograms of the chest confirmed the physical findings. Fluoroscopic examination and plates of the abdomen after an opaque meal showed moderate pylorospasm and considerable six hour residue. The duodenal cap was very large and dilated with considerable lagging of the meal in the second and third portions of the duodenum. No constant deformity to indicate ulcer in either stomach or duodenum. (It is barely possible that the duodenal constriction was caused by a tuberculous peritonitis.)

No operation. Patient left the hospital unimproved.

CASE 4.—*Clinical Summary: Neurotic girl complaining of vomiting, abdominal pain and distention; previous appendectomy with no amelioration of symptoms; Roentgen-ray examination showed gastroptosis and marked dilatation of the duodenum. No ileal stasis.*

Miss P. (7386), aged 15 years. Date: Jan. 25, 1917. Complaint: Pain in the right side of the abdomen, vomiting and nervousness.

*History.*—The past history has no direct hearing on her present condition except to note that she had never been well or strong. Average weight, 113 pounds. Present weight, 106 pounds.

The present illness began about three years ago when the patient complained of abdominal distention with nausea, vomiting and pain throughout the right side. She was operated on two years ago for an attack of supposed acute appendicitis but her family physician states that the appendix showed very little evidence of being diseased. This was followed by no improvement. Her pain, distention and vomiting occur in attacks lasting one to three weeks. She has almost constant nausea coming on as soon as she eats. Occasionally she has sour stomach and belching. The bowels are regular.

The patient has had some headache and considerable vertigo. She has always been very nervous and at times laughs and cries in an uncontrollable way. She has had a good many fainting attacks.

*Examination.*—This revealed enlarged tonsils and several decayed teeth. The abdomen was very difficult to examine as the skin appeared to be everywhere hyperesthetic and the patient could not be made to relax. The physical condition was otherwise negative.

The blood and urine were negative. The Wassermann test was negative. Gastric analysis by fractional method showed moderate subacidity.

Neurologic examination was negative, with no evidence of true epilepsy.

Roentgen-ray examination of gastro-intestinal tract showed some gastroptosis with slight dilatation of the stomach and very marked dilatation of the duodenum. No ileal stasis; colon peristalsis was good.

Medical treatment was outlined and patient returned to her home in a distant part of the state.

CASE 5.—*Clinical Summary: Vomiting and abdominal pain for five years; previous cholecystostomy without relief; visceroptosis; operation; chronic mesenteric ileus with dilated duodenum.*

Mrs. M. (7435), aged 41 years. Date: Feb. 17, 1917. Complaint: Vomiting, and pain in the right side of the abdomen.

*History.*—The past history is unimportant. Average weight, 93 to 94 pounds. Present weight, 85 pounds.

The present illness began five years ago with soreness in the right side of the abdomen just below the costal border, headache, nausea and vomiting. On operation in another city four years ago the gallbladder was drained; no stones were found. No relief was obtained and two months later she was much worse. The same symptoms have continued.

Vomiting generally occurs two to four hours after eating. The vomitus is very sour and almost always contains much bile. No relief is obtained by food or soda. There are flatulence and distention. There have been no attacks of acute abdominal pain. The bowels are slightly constipated. The stools are occasionally light colored.

*Examination.*—This proved negative except for evidence of visceroptosis and considerable emaciation, and moderate diffuse abdominal tenderness, possibly more marked in the upper right quadrant. Gastric analysis was normal. Blood and urine were negative. The Wassermann test was negative.

*Operation* (Dr. A. M. Willis).—Operation disclosed adhesions about the gallbladder and a greatly dilated duodenum to a point where it went behind the mesentery; the adhesions were freed and the gallbladder removed. An attempt was made to relieve the duodenal obstruction by widening the slit in the mesentery. The patient was advised to follow the operation with a prolonged rest cure in order to increase her weight. She made an uneventful convalescence from her operation and left the hospital much improved.

CASE 6.—*Clinical Summary: Nausea and vomiting for four years; habitus enteroptoticus; previous appendectomy; Roentgen-ray examination revealed pronounced visceroptosis with dilatation of the duodenum and stomach.*

Miss R. (7600), aged 20 years. Date: April 4, 1917. Complaint: Nausea and vomiting.

*History.*—Unimportant. Average weight, 85 pounds. Present weight, 82 lbs. About 4 years ago the patient began to suffer with nausea, headache, backache and weakness. She was treated for "chlorosis" for two years. She was operated on in September, 1916, for acute appendicitis. Her appetite is poor. She has nausea and vomiting nearly every day. This generally occurs immediately after eating and the vomitus consists of food and bile. She has heartburn occasionally and gnawing but no abdominal pain except at the time of her attack of appendicitis. Her bowels are regular. She has frequent headache, but no fever.

Complete physical examination was negative. The blood and urine were normal. The Wassermann test was negative. Gastric analysis by the fractional method showed a normal secretion.

Roentgen-ray examination of the chest showed that it was extremely elongated in comparison with its horizontal diameter. Heart was small and vertical. There was no evidence of tuberculosis.

Roentgen-ray examination of gastro-intestinal tract showed dilatation and ptosis of stomach, the greater curvature reaching into the pelvis. There was no evidence of ulcer; no pylorospasm, but distinct six hour residue; marked dilatation of duodenum; whole colon was very low. Also ptosis of liver and spleen.

This patient was placed on medical treatment in the hospital and her vomiting ceased promptly. After three weeks she returned to her home in the country to continue her treatment.

## COMMENT

As to the incidence of duodenal obstruction from all causes, Anders,[8] writing in 1912, was able to collect 262 cases. In over one half of this number the stenosis was the result of duodenal ulcer. In twenty-nine cases, or 11 per cent., the constriction was attributed to compression by the root of the mesentery. In examining Anders' statistical table it is seen that

8. Anders: Am. Jour. Med. Sc., 1912, **144**, 360.

twenty-seven of these twenty-nine cases were reported by one author as having been found in 120 necropsies of patients dying with acute dilatation of the stomach.[9]

The earliest references to chronic dilatation of the duodenum appear to have been made by Glénard[10] (1889) and Kundrat[11] (1891), both of whom stated that a persistent, incomplete obstruction of the duodenum by the root of the mesentery was not uncommon and led to a gradual dilatation of the duodenum and stomach. Albrecht[1] (1899) mentioned two cases which he thought might have been instances of this condition, and Robinson[12] of Chicago (1900) asserted that in the course of several hundred postmortem examinations he had met with fifteen or twenty examples of gastroduodenal dilatation due to such incomplete obstruction.

Connor,[3] writing in 1907, states that nothing is known of the clinical manifestations of such chronic obstruction, but calls attention to the instances of duodenal dilatation reported during the preceding two years by three American surgeons (Finney,[13] Mayo,[14] and Ochsner[15]) and suggested that these cases were probably due to mesenteric obstruction.

Finney, in his brief report, simply called attention to certain cases seen in the preceding five years which he believed had not been mentioned in the literature, that is, dilatation of the duodenum with a patent condition of the pylorus. All of his cases were associated with visceroptosis and nothing that was done seemed to relieve the symptoms (chronic indigestion with nausea and vomiting). Only one of his cases was diagnosed before necropsy. Gastro-enterostomy was done in several instances but was found wanting, and gastric lavage gave only partial success. He referred in his report to the possible benefit to be derived from postural treatment. He concluded that the condition is a definite clinical entity. In the discussion of his report the operations of jejunostomy and duodenojejunostomy were suggested.

Ochsner's two papers, profusely illustrated from careful dissections, called attention to the hypertrophy of the walls of the duodenum which was evidently secondary to the chronic obstruction that he failed to observe or interpret. Mayo simply referred to the instances of dilated duodenum reported by Finney and Ochsner and stated that he, too, had observed such a condition.

Bloodgood,[5] writing in 1912, says that he recognized his first case of chronic dilatation of the duodenum in 1906 during the course of an exploratory operation. The obstruction was not relieved and the patient came to necropsy twenty-seven days after operation. He describes a second similar fatal case in the service of a colleague in which a pyloroplasty was performed without relieving the symptoms (vomiting of duodenal contents). In both of these patients there was great dilatation of the duodenum associated with visceroptosis. He then reports five subsequent cases in which he recognized at operation the relation of the duodenal dilatation to ptosis of the colon, and was able to relieve four of these patients completely by resection of the right half of the colon and ileocolostomy. Bloodgood also refers to the report of Stavely,[16] of Washington, who performed a duodenojejunostomy in 1910 for chronic gastromesenteric ileus followed by complete cessation of symptoms.

Bircher,[17] like Finney, looks on duodenojejunal ileus as a clinical entity. He reports three patients with recurrent attacks of vomiting, and duodenal stasis on Roentgen-ray examination. Operation in each of these cases showed dilated duodenum with stomach of normal size, ileum and jejunum practically empty, and a more or less rigid cord causing constriction at the mesenteric slit.

Since 1912 only a few isolated reports have appeared dealing with chronic dilatation of the duodenum. Barber[18] refers to the coincidence of dilatation of the duodenum and ileac stasis as recognized by Roentgen-ray studies on gastro-intestinal cases, and reports his experimental studies on dogs. He found that incomplete obstruction of the extreme caudad ileum gave rise to dilatation of the cephalad duodenum but he questions whether this result is mechanical or a neuromuscular reflex.

Melchior,[19] in discussing arteriomesenteric occlusion of the duodenum, emphasizes the fact that the organs in the abdominal cavity either float or rest on the organs below, and these on the floor of the pelvis and the abdominal wall. He takes exception with those authors who maintain that the viscera are suspended by their ligaments or mesentery, although there is nothing in his argument to disprove the result of traction on the mesentery in visceroptosis.

Dilatation of the duodenum in childhood, except in cases of congenital atresia, is apparently rare. Two instances, however, are reported by Frank.[20] One of these was demonstrated at operation in a girl 11 months old in whom there was marked dilatation of the stomach and the duodenum to the point where it was crossed by the root of the mesentery. Beyond the root of the mesentery the intestine was collapsed. Complete recovery ensued and the child, at 18 months of age, was well and strong and had no digestive disturbances. In a second child, 2 years old, suffering from recurring attacks of vomiting, Frank diagnosed chronic dilatation of the duodenum on Roentgen-ray examination and advised operation, which the parents refused. From the symptoms and Roentgen-ray findings he felt certain that the occlusion of the duodenum was due to mesenteric constriction.

The symptoms of chronic dilatation of the duodenum are those of an infrapapillary constriction, that is, an obstruction below the entrance of the common bile duct and the pancreatic duct into this portion of the bowel. They may be conveniently grouped as follows:

1. Persistent, or recurring, vomiting. In most instances the vomitus contains bile, often in considerable quantity.

2. Pain in the upper part of the abdomen, generally referred to the right hypochondrium. As a rule, this is described as an aching or dragging pain, but it may be severe so as to suggest biliary colic, or, in other instances, it simulates the pain of peptic ulcer with irregular food-relief.

9. Laffer: Ann. Surg., Philadelphia, 1908, **48.**
10. Glénard: De l'Enteroptose, Presse méd., Belge, 1889.
11. Kundrat: Ueber eine seltene Form der inneren Incarceration; abstr., Wien. med. Wchnschr., 1891, **41,** 351.
12. Robinson: Am. Pract. and News, 1900, **20,** 124.
13. Finney: Johns Hopkins Hosp. Bull., 1906, **17,** 37.
14. Mayo, W. J.: Chronic Ulcer of the Stomach and First Portion of the Duodenum, THE JOURNAL A. M. A., Oct. 21, 1905, p. 1211.
15. Ochsner: Ann. Surg., 1906, **43,** 80.
16. Stavely: Surg., Gynec. and Obst., 1910, **11,** 288.
17. Bircher: Zentralbl. f. Chir., 1912, **39,** 843.
18. Barber: Ann. Surg., 1915, **62,** 433.
19. Melchior: Berl. klin. Wchnschr., 1914, **51,** No. 38; abstr., THE JOURNAL A. M. A., Oct. 31, 1914, p. 1611.
20. Frank: Zeitschr. f. Kinderh., 1913, **9,** 99.

3. "Habitus enteroptoticus," often associated with exaggerated lordosis.

4. Obstinate constipation is the rule, although this may not be a feature of the case. Occasionally the stools are colorless and relatively free from bile.

5. Vague toxic symptoms are common. Headache is frequently a prominent symptom. These patients appear to be peculiarly sensitive and of an unstable nervous temperament. In marked cases starvation with acidosis develops and leads to a fatal termination.

The chief clinical interest in chronic dilatation of the duodenum lies in the fact that the symptoms are almost invariably misinterpreted. In one group of cases with lesser grades of obstruction no obvious cause is noted for the condition, and it is therefore thought to be functional. As I look back on a large number of thin, neurotic, enteroptotic women whom I relieved of "hysterical vomiting" by means of rest cures with psychotherapy, forced feeding, massage, etc., I now feel convinced that my complacency in the successful outcome in many instances was due to the increase of weight which such patients obtained, thereby relieving the visceroptosis and the chief factor in chronic mesenteric ileus. The longer one practices medicine with an open mind and an inquisitive instinct, the more one questions the diagnosis of hysteria. Furthermore, a clinician has only to see the necropsy on one patient with an unrecognized chronic mesenteric obstruction, such as the first case in the series reported above, to appreciate what a real condition it is and how it is possible for the lesser forms of obstruction to pass undiagnosed except under the title of neurosis. At once there comes to my mind the sensations of a well-known neurologist who, in demonstrating several patients with disseminated sclerosis that had been previously treated for hysteria, finally exploded with the remark, "Gentlemen, there is a special compartment in hell for the doctor who treats disseminated sclerosis as hysteria.".

In a second group of cases the clinical picture is very suggestive of cholecystitis. In the absence of proper Roentgen-ray studies this is the usual preoperative opinion in patients with a rather pronounced obstruction. The attacks of abdominal pain may recur over a period of months with finally insistent demands for surgical relief. In addition to the cases reported in this paper, I have had six patients with chronic dilatation of the duodenum due to adhesions and abnormal peritoneal folds, five of whom came to operation with the diagnosis of chronic cholecystitis. In the sixth patient peptic ulcer was thought to be present.

In a third group of cases with persistent incomplete obstruction, vomiting is almost continuous and leads to the death of the patient. In such cases the abundant and constant entrance of bile into the stomach is almost pathognomonic. In addition, the stomach, even when it has been completely emptied the evening before, may be found the next morning to contain large quantities of bile-stained fluid. While one expects and frequently finds more or less abdominal distention in these cases, yet the abdomen may be peculiarly retracted and soft all through the illness, as in Case 1 of my series.

The diagnosis, except in those cases discovered at operation or necropsy, can be reached only by having the condition in mind as a clinical entity, and then confirming it by a competent Roentgen-ray examination.

The treatment of chronic dilatation of the duodenum may be either medical or surgical, depending on the degree of obstruction. In the simpler cases a well conducted rest-cure, with increase of weight and the deposit of fat in the various supporting tissues of the abdominal cavity, brings about an entire cure of the condition. In more obstinate cases postural treatment has been successful. By placing the patient in the knee-chest position, the weight of the stomach and intestines pulls the viscera toward the anterior abdominal wall, thus tending to release the compression on the duodenum. The knee-chest position may be maintained for fifteen minutes every two hours, the patient lying on his face and abdomen in the intervals. If the vomiting stops for a few hours, the pleasanter left side position may be ordered, with the hips elevated. This treatment may be supplemented by frequent washing out of the stomach with the tube.

In the severer cases, where starvation and acidosis threaten, medical measures are entirely inadequate. From a review of the scattered case reports in the literature one finds that several widely different surgical procedures have been adopted with subsequent cure of the patient. Some operators have succeeded in widening the duodenal slit in the mesentery. In other cases duodenojejunostomy has been effectual. Again, resection of the right half of the colon with ileocolostomy has been done with complete relief to the distressing symptoms. With few exceptions, the operation of gastro-enterostomy has signally failed in gastromesenteric ileus. More careful study of this form of chronic intestinal obstruction will probably result in the adoption of a uniform method of procedure applicable to these cases.

## CONCLUSION

We have in chronic dilatation of the duodenum a clinical entity, with a definite symptomatology and characteristic Roentgen-ray findings, due to compression of the terminal portion of the duodenum by the root of the mesentery. It is a feature of many cases of visceroptosis and is a remediable disease subject to proper mechanical treatment.

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## ABSTRACT OF DISCUSSION

DR. LEWIS A. CONNER, New York: Dr. VanderHoof has rendered us a real service in bringing to our attention so clearly this clinical picture which, for most of us, certainly is not one which is apt to come into mind. Duodenal obstruction and duodenal dilatation we have been more familiar with as an acute condition in association with acute dilatation of the stomach. The chronic type is perhaps really the more important and frequent type, and is one to which attention certainly should be drawn. The mechanical factors involved are still, it seems to me, very obscure. There can be no doubt that the obstruction by the root of the mesentery and by the superior mesenteric artery is a real one; but when one attempts to explain what the conditions are that bring about such an obstruction, there are many difficulties. Certain things are obviously necessary; if the mesentery is to pinch the duodenum, it must be tight and there must be traction in a certain direction. Those conditions are fulfilled by the small intestine being in the true pelvis and being empty; it cannot be in the true pelvis unless it is empty. Dr. Bloodgood and others have emphasized the drag of a mobile caput coli as an important factor. Apparently the mesentery must be neither too short nor too long in order to constrict the duodenum. An increased lordosis of the lumbar spine or downward displacement of the terminal portion of the duodenum certainly predisposes to constriction. Undoubt-

edly some of the cases which have been classed as functional recurrent vomiting are instances of constriction of this terminal portion of the duodenum. The difficulty is to say just which of them are, because we know that they are not all of that type. It seems to me important to emphasize the fact that the obstruction and not the dilatation is the important thing. We will have to rely chiefly on the Roentgen-ray findings for diagnosis. There are, however, a few things to bear in mind: the difficulty of diagnosis is greater because of the fact that cases of persistent vomiting from whatever cause are apt to be of duodenal type. Any persistent vomiting soon becomes intestinal in character; the vomitus contains bile and pancreatic juice and is alkaline and has most of the characteristics of duodenal obstruction, so the type of vomiting cannot be relied on as evidence of actual obstruction. One other matter is important to bear in mind: When there is high intestinal obstruction, great diminution or suppression of the urine is one of the common and reliable symptoms, and it seems to me that the behavior of the urine may help us to make the diagnosis and give us a clue to the progress of the condition and the necessity for surgical interference.

DR. GEORGE R. SATTERLEE, New York: There is one important point to bring out. We have all seen duodenal obstruction or duodenal dilatation due to obstruction around the ileocecal region, as Dr. Bloodgood has pointed out. I have been struck by the number of patients who have a duodenal dilatation as shown by the Roentgen ray, and who have merely an enteroptosis; also by the fact that this is connected with atonic dilatation of the cecum; these two things often go together. In visceroptosis there is a drag on the mesentery, and we have a great many reflex reactions through the sympathetic nerve system. Now the symptom of dilated duodenum is often pain, and I should like to cite a case in which the pain was in the liver region and the patient was operated on for relief of pain, and there was found a long, ptosed gallbladder and enteroptosis. Later, the patient was operated on for appendicitis and was finally relieved by the proper treatment for enteroptosis, namely, posture. If we cannot decide that it is an operative case, we can place this patient in proper posture by elevation of the foot of the bed, abdominal support and proper treatment of the constipation, etc., which may give relief to the pain, and is worth trying. It seems to me a great many of these enteroptotics are treated for neuroses.

DR. F. B. TURCK, New York: The presentation of these eleven cases is very important, because it opens up the clinical view of scientific facts which have been recently investigated in this country. Dr. Senn of Chicago brought out, in 1888, some experimental facts on intestinal obstruction, and proved that mechanical obstruction alone cannot produce symptoms. Senn also showed that not until the venous circulation is interrupted do pathologic conditions arise. The work of Dr. Whipple and Dr. Hartwell has shown that complete obstruction is necessary before any symptoms can be produced. The fact that there is, in duodenal disturbance, a dilatation of the cecum with atony shows that it is not merely a mechanical question. It points to some more general functional derangement. We found through our experimental work that colloid material (undigested albumin, such as white of egg or bacteria in suspension) can penetrate unchanged into the walls of the intestines and can pass along the submucous tissue cephalad. Reaching the upper intestinal tract they are split up by the action of the powerful enzymes in the wall, and toxic effects are produced. We produced symptoms of degeneration and fatigue in the muscle cells, and the two conditions are identical in man and animals. We are dealing with biologic problems in these cases of atonic dilatation, and we must treat them along biologic lines, and not look on them as being simple problems in mechanics alone. We are dealing with physiologic laws, which we must meet with physiologic methods of treatment.

DR. W. L. BIERRING, Des Moines, Ia.: I should like to add an observation to this discussion. In a case of tabes with attacks of epigastric pain and vomiting, the roentgenologic examination revealed a stenosis of the duodenum, which justified reference to the surgical service for operative relief. When the viscera were exposed the stenosis was recognized as spastic in nature, similar constriction occurring in the stomach, and the site varied with succeeding peristaltic waves. The attacks of pain and digestive distress in this instance were incident to visceral crises, and illustrate that the condition referred to in the paper may be simulated in organic nervous diseases.

DR. FRANKLIN W. WHITE, Boston: Since this condition of chronic duodenal obstruction has been so clearly described, it is well to remember its extreme rarity even when the digestive organs drop down very low. This may give a sharp duodenal angle, but the angle rarely causes obstruction. The duodenal angle may be compared with the splenic flexure, which is usually sharp but not obstructive. We must consider function and not anatomy. I am sure the time is now at hand when the diagnosis of duodenal obstruction will be made, not at operation or necropsy, but by the Roentgen ray. No other method shows so well the place and degree of obstruction in the digestive canal.

I should like to ask how much residue was left in the duodenum and how much delay in emptying the stomach was found in these cases.

The symptoms will prove a poor guide in diagnosis. Many of these patients have congenital asthenia and ptosis, the symptoms of which blend with and cover those of dilated duodenum. The Roentgen ray will help us most in diagnosis. The treatment is largely that of marked ptosis.

DR. DOUGLAS VANDERHOOF, Richmond, Va.: Dr. Conner is well qualified to discuss this subject. In his monograph published ten years ago he went thoroughly into the causes of acute dilatation of the stomach and duodenum. The thing that caught my eye at that time was Dr. Conner's statement that practically nothing was known of the symptomatology of chronic obstruction in the duodenum. As a matter of fact, references in the literature show only sporadic case reports. Dr. White is quite correct, I am sure, in emphasizing the physiology as well as the anatomy of such forms of obstruction. In answer to his question as to how much residue may be left in the stomach in these cases and how much delay may occur in the duodenum, I should like to read a brief description of the Roentgen-ray picture in these cases. (See reference to Jordan's article, which had not been read when the paper was presented.) Barber's experiments showed that partial constriction of the caudad end of the ileum produced dilatation of the cephalad end of the duodenum. He questions whether the result is mechanical or due to a neuromuscular reflex. To my mind the effect is mechanical, associated with the mesenteric drag and subsequent duodenojejunal kinking.

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**Fermi's Modification of Pasteur Treatment of Rabies.**—C. Fermi is professor of hygiene and chief of the Pasteur Institute of the University of Sassari, Italy. He has recently published the full details of what he calls the "new Italian method of antirabies treatment," although it has been in use since 1909. The vaccine is a 5 per cent. emulsion of the most virulent fixed virus, made from the brain (rabbit or dog), rendered avirulent with 1 per cent. phenol (carbolic acid). He uses mixed with this vaccine an antirabies serum derived from the horse, prepared with this vaccine for the antigen (two daily injections of 10 c.c. of the vaccine) for a month; pause of two weeks; then continued another month; pause of twenty days; withdrawal of from 3 to 6 liters of blood. The antirabies serum thus obtained is mixed with three times its volume of the vaccine, and after the mixture has stood on ice for twenty-four hours, 3 c.c. are injected subcutaneously in the morning and 3 c.c. in the evening. This is repeated for five or ten days, and then, for an additional twenty or fifteen days, the vaccine alone is injected. A set of vials for home treatment comprises ten or twenty vials of the sero-vaccine mixture, and forty or twenty of the vaccine alone. The 164 page pamphlet describing the technic and the comparative tests and experience with it was issued as a supplement to the *Annali d'Igiene*, 26 (Via Sistina, 14, Rome).

# THE FAMILIAL TENDENCY TO FAT INCAPACITY IN INFANCY AND CHILDHOOD*

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The occurrence in a certain number of babies of an inability to digest the usual dietetic amounts of the fat of cow's milk is now generally accepted. Many of us, however, recall the day when not only was this element of cow's milk given to babies in amounts which for some proved excessive, but when the cause of the bad results from such feeding was sought among the other elements of the milk.

When later the real factor was recognized, the reduction of the excessive fat and the use of mixtures made from whole milk, though often remedial, did not serve in all cases to eliminate the difficulty, and the next logical step was to employ milk, more or less skimmed, in feeding infants whose digestive capacity had been seriously disturbed.

It is possible that the pendulum swung for a time too far in this direction, owing to a failure to recognize still other factors which entered into the feeding problem. Nevertheless, it must be admitted that a certain residuum of babies may still be found who do not tolerate well the fat of cow's milk, and it is one of my purposes to carry this a step farther and point out that it is not always a temporary incapacity, which may be overcome by careful feeding, but is in some instances an inherent characteristic which must be recognized if the best results for the individual are to be attained in later infancy and childhood.

Our knowledge of this matter has been of slow growth, certain obvious analogies in somewhat later life having been apparently overlooked. Long before the days of modern infant feeding, it was currently accepted that certain adults could not take cow's milk in any quantity without suffering as they asserted, from constipation and "biliousness." Even before the recognition of fat constipation in infancy and childhood, it was known that some of these adults could take skimmed milk or fat-free buttermilk without producing these symptoms.

Of late years, pediatricians, in increasing numbers, have found that older children suffering from nutritional disturbances of rather vague origin but more definite symptomatology were not only not benefited when they were given more of a supposedly digestible milk, but were greatly improved when the quantity of their milk was reduced, when it was skimmed, or, in some cases, when it was withdrawn entirely from the dietary. In some instances, this has apparently been done because of a suspected analogy to the fat incapacity of infancy, but more commonly on the ground that the milk did not agree with them.

Some who have so treated older children must have been aware, from the histories in their hands or from careful inquiry, that these children had suffered at some time in their infancy from fat injuries or incapacity; but so far as I know, no deductions have been drawn in our literature from this significant relation.

Let me state the proposition this way: If not a few older children are found who do better with little or no milk and whose histories reveal that they suffered in infancy from disturbances evidently due to the fat of cow's milk, is it not a justifiable deduction that a certain number of infants who have shown a fat incapacity cannot wisely be given much whole cow's milk as they grow into childhood?

I myself have long since recognized that it was a mistake to aim at getting all such infants back to a full-fat milk, but that more general success was to be attained by continuing to feed partially skimmed milk, and to limit its amount in order that the sum total of fat, even in such skimmed milk, should not exceed their capacity.

The latter precaution is not irrational, for we have some precedents. We recall that although this country passed through a period of high fat feeding for infants, we did not originate the term *Fettnahrschädigung*. This came from German sources, and the Germans habitually use dilutions of whole milk in infant feeding and not our superfatted mixtures. There the only explanation of the fat injury lay in the fact that even diluted whole milk, if given in the strong mixtures commonly employed abroad, could carry with it sufficient fat to overtax the infant's capacity. This overtaxing may have occurred more frequently because disturbances of digestion are complex in their origin, the more evident fat indigestion being aggravated by similar if less evident difficulty arising from overfeeding with the other elements of the milk.

A similar overstepping of the capacity for fat can be reached in susceptible patients who are taking partially skimmed milk, a typical example of which I observed last summer. Although 5 ounces of cream were removed from the quart bottle before the milk mixture was made, loose irritating stools were caused when the daily quantity of partially skimmed milk was pushed beyond a certain point. Exactly the same effect had been produced previously by increasing the fat content of the milk employed without increasing the number of ounces used in the mixture. This underweight baby of 14 pounds gained 4 pounds from August to November, only to show the old symptoms on the gradual but injudicious addition of 2 more ounces of the partially skimmed milk. The parents have now been warned against attempting to give their baby other than skimmed milk throughout its childhood, and that if they do give it whole milk, obscure symptoms of nutritional disturbance may appear, the cause of which may not be recognized.

If the plan of adhering to skimmed milk were followed in more cases of limited fat capacity, the progress of such children would be more normal, and the skimmed milk, which is in itself a valuable food, could be retained in the dietary. Also, it would less frequently be necessary to eliminate milk altogether from the dietary of older children because of long standing subacute digestive disorders.

Associated with such disorders, we often find a characteristic lack of appetite and a small range of diet, many ordinary wholesome articles of food being refused whimsically, probably because the children have been cloyed with their milk fat. Often also they have been allowed butter very freely, owing to a desire to improve their nutrition. This hydrocarbon satiety and disturbance is doubtless comparable to the carbohydrate satiety found in children who have been allowed an excess of sucrose.

This same disturbing element may at times be recognized in children not especially predisposed to such

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disturbance who habitually drink excessive quantities of milk daily, or a considerable amount of high-fat milk from fancy blooded herds of Jersey, Alderney or Guernsey cows. In such cases, a reduction of the milk taken or the removal of a part of the cream may be all that is essential to bring about improvement.

Thus far I have not spoken of any familial tendency to fat incapacity. The recognition of this tendency followed naturally from the observation in the same families of more than one infant showing limited fat tolerance, although the methods of feeding employed varied with the intervals elapsing between their births. It was inevitable, in caring for successive children born into the same families, that the digestive difficulties and peculiarities of the earlier children should be recalled when undertaking the feeding of a new scion of the house. This is a concrete example of the value of that type of experience which may be lost with the passing of the old-time family physician.

When, however, an infant, born before the days of the recognition of limited fat tolerance, had been difficult to feed, and a second infant, born about the time of our realization of the import of such limitation, had been rescued from similar difficulties by the application of the new knowledge, what could be more natural than that, with the advent of a third baby, similar tendencies, when manifested, should be met at the outset by appropriate measures, and much better results obtained?

The foregoing sketchily outlines an earlier experience in one family. A more recent one is as follows: Two children had previously been born in a family; each had thriven remarkably well at birth, but each in turn, on being weaned at 9 or 10 months of age, had done very poorly on cow's milk, remaining approximately stationary for months until limited to a pint of skimmed milk daily, with increase of other foods to provide for their caloric needs. With the birth of a third child, there was the same successful maternal nursing, but when the time for weaning came, instructions were given that the baby should receive only skimmed milk, supplemented by other food. This was clearly understood by the parents not to be a temporary but a permanent order.

The results were most satisfactory. Progress on the bottle was uninterrupted, and the child has done well, in marked contrast to the two older children. While always unsafe to generalize on a limited number of instances, the last case certainly has every appearance of substantiating the familial theory on which the feeding was planned.

The title "familial tendency" has been employed to focus attention on successive instances of fat intolerance in the same family, as well as to suggest caution in the giving of normal amounts of fat to infants subsequently born into such families. Final acceptance of the theory must, of course, await corroboration from the experience of others.

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## ABSTRACT OF DISCUSSION

DR. LOUIS C. AGER, Brooklyn: I do not think any of us can doubt for a moment the occurrence of such cases as Dr. Southworth has mentioned. We know it from previous generations in which there is inability to digest fat. What I want to point out is the danger of having this idea promulgated without a warning. While it is true that there is a small proportion of children unable to digest any fat, we have a very much larger class in which fat intolerance has been produced by high fat feeding, which we have not become rid of in New York, at any rate. Those children can be brought back to a normal fat digestion if the problem is worked out with sufficient patience, but when a parent has learned that a child has been disturbed by fat feeding, it makes her fear it. I know of three instances in which it was very difficult to persuade a mother gradually to go back to normal fat feeding, and in one instance, when another child came into the family, the mother could hardly be persuaded to use a normal fat formula. The average child will digest a normal amount of fat without difficulty.

DR. FRANK C. NEFF, Kansas City, Mo.: Dr. Southworth has made a valuable observation in this matter of familial tendency to fat intolerance, although I think we must be very careful about determining whether it is a familial tendency, or due to unwise feeding. The physician should have attended several children in the same family in order to determine whether it is a familial tendency, rather than a condition due to fat injury. Again, I think we make a mistake in determining that fat intolerance is due to one element rather than to the food itself. There is a cow's milk incapacity in certain families, because we undoubtedly find parents as well as children who have never been able to take milk without untoward results. Therefore, in order to be able to say that it is a fat incapacity, the character of the stools should be studied. Then, the fact that the baby has never thriven, even on breast milk, is important. My experience has been that where the child has not gained properly, even on breast milk, the reason has been an inability to digest the fat contained in the breast milk, which undoubtedly is higher than in the ordinary milk mixture, and therefore trouble would show up if fat incapacity were the real trouble.

DR. FRITZ TALBOT, Boston: In considering fat incapacity in the infant we must all bear in mind that it is a hard thing to say that fat is the sole and primary cause of the indigestion, and I think the term "fat indigestion" is very loosely used. Many times what seems to be fat indigestion is due to too much sugar. The diagnosis of fat incapacity should be made only when other causes have been ruled out. Experience has shown that in many instances the fat in cow's milk cannot be digested, while the fat in butter, cod liver oil, or olive oil is digested in a normal manner. Mistakes of diagnosis can be eliminated in many instances by careful microscopic examination of the stools. If there is not fat in the stools, or only a very small or microscopic amount, then one can be pretty sure one is not dealing with fat as a basis for the trouble.

DR. BERT R. HOOBLER, Detroit: It seems to me we are treading on dangerous ground in attempting to attribute this to familial tendency. It is much more apt to be the method of living that has been prevalent in the family. Perhaps the cook has been in the habit of serving certain types of food largely, and using large quantities of cream or butter in the food. I recall some instances in which I have been exceedingly interested in finding several children suffering from what has been called fat incapacity or indigestion. These families went out in the spring to a country home where there was a fine herd of Jersey cows, and it was not long before I was beginning to make visits to the home. At first we tried to eliminate these troubles by prohibiting milk, and giving the children skim milk, but still the trouble persisted, and not until I got into the kitchen and inquired how the cook prepared the food, was it possible to get at the real difficulty. I think oftentimes this is the real difficulty, rather than an inherited tendency.

DR. DAVID E. ENGLISH, Summit, N. J.: Dr. Southworth did not say anything about the breed of cow. Is it not true that the Guernsey and Jersey cows produce milk with a fat globule that is too large and too tough for the infant to digest easily? Does it not make a difference in those babies who seem to have an idiosyncracy to milk fats if they are given milk from a cow of a different breed?

In the milk commission, of which I am secretary, we have found that a mixture of 45 per cent. Holstein, 45 per cent. Devon (or red cow) and only 10 per cent. Jersey makes a

more even percentage of fat, our average for the year being 4.18. I should like to ask if the breed of cow was taken into consideration in this study of fat incapacity.

Dr. Thomas S. Southworth, New York: First, I might answer Dr. English's question. I spoke of the fact that such fat disturbances could readily arise from taking considerable quantities of the milk of Jersey, Guernsey or Alderney cows, as well as from taking excessive amounts of milk of lower fat content. It is somewhat difficult always to separate in this type of cases a fat injury from a natural fat incapacity. The fact is, where the infant has a limited fat capacity, a food injury may be produced by normal amounts of fat.

In answer to Dr. Ager and his caution, which is a proper one, I would say that this paper is directed to the profession and not to the laity.

I believe Dr. Neff is right, although I have not said in my paper that a tendency to fat indigestion may be found in some parents as well. Very fat breast milk unquestionably, as has been said, often starts trouble. Where there has been difficulty in digesting a high fat in breast milk, one often finds trouble with normal amounts of fat in cow's milk, and these children are notoriously difficult to shift over to artificial feeding. This is very commonly done on the supposition that the mother's milk is bad or poor, when really it is a high fat milk.

In answer to Dr. Hoobler, I would say that in many cases of children having fat disturbances, when one has not seen them in infancy, if one goes carefully into the history one can trace the cause in many instances to trouble with fat feeding in infancy. The fancy herds of cows possessed by well-to-do families are certainly great factors in fat disturbances. I remember one family in which child after child had trouble, and investigation brought out that they were having very rich milk sent in from the country. The superintendent of the farms, desiring to make a particularly good showing, was shipping milk in bottles from the tops of the cans, which gave too large a percentage of fat for these children.

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## CHOLECYSTOSTOMY VERSUS CHOLECYSTECTOMY *

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What is the function of the gallbladder, and of how much importance is it to the human economy? This is the paramount question that presents itself in a discussion of the relative merits of cholecystectomy and cholecystostomy. Man does not need bile in the intestine except when digestion is going on. During the period that the bile remains in the gallbladder it undergoes important changes, as is shown by comparison of the bile obtained from the gallbladder and that obtained from the bile ducts. During its stay in the gallbladder the bile has added to it mucin or nuclear albumin, and what is of much greater importance during its stay in the gallbladder, the bile has added to it sodium glycocholate and taurocholate. According to the tables of Yeo and Herroun and Hoppe-Seyler,[1] this gain of the combined salts amounts to 3.69 parts in 100 parts of bile. The secretion of pancreatic juice parallels the discharge of bile from a fistula. The bile activates the pancreatic juice. Williams and Martin[2] have shown that the amylolytic power of pancreatic extracts is doubled by the addition of bile salts. The fat-splitting action of pancreatic juice is trebled by the addition of bile.

The neck of the gallbladder is on a higher level than the lowest point of the gallbladder; therefore, the weight of the bile is away from rather than toward the outlet. The muscular coat of the gallbladder is strong and the fibers are disposed both longitudinally and transversely. The mucous secretion of the gallbladder is abundant. There is a well developed sphincter of the common duct. The gallbladder is present practically always in man and in those animals whose digestion may be said to be intermittent rather than remittent and continuous. Animals that have no gallbladder have relatively large bile ducts. Experience has shown that removal or obliteration of the gallbladder in man leads to dilatation of the bile ducts, while experiments on the lower animals show the same results.

The results of the experiments of Judd and Mann of the Mayo Clinic,[3] which were published since this paper was written, confirm these observations. These observers concluded that the dilatation following removal of the gallbladder is due chiefly to the sphincter of the common duct. They also found that the dilatation was less marked in goats after cholecystectomy than in dogs after the same operation. The inevitable conclusion from these experiments seems to be that for a time (about sixty days) after removal of the gallbladder there is increase in the pressure in the ducts; that by this time the ducts are fully dilated, the sphincter loses its power, and with a constant flow of bile into the intestine the bile pressure falls.

The effect on the pancreas of increased pressure of the bile within the ducts has been amply demonstrated. Flexner[4] reports from his experiments that the entrance of bile modified by a diminution of its salts or by an increase of colloid material into the pancreatic duct is likely to set up chronic pancreatitis, while fresh unaltered bile sets up acute changes. Hohlweg,[5] in making gastric analyses from thirty-nine patients following extirpation of the gallbladder, found that only 10 per cent. had normal hydrochloric acid. The remainder, 74.3 per cent., had either subnormal values or actual deficit of hydrochloric acid. Among forty-three patients with closure of the cystic duct or atrophy of the gallbladder, 84 per cent. exhibited a hydrochloric acid deficit. Deaver[6] says: "It is our firm belief that the gallbladder has important functions to perform, of which the chief are to equalize the pressure of bile in the ducts and to secrete mucus which shall dilute the bile." With all the foregoing facts in mind we cannot accept Moynihan's[7] dictum that the gallbladder is devoid of any strikingly useful purpose. On the contrary, the conclusion seems inevitable that in man the gallbladder has a very important function to perform. In a word, it may be said that the gallbladder in man is an important organ but not a vital one.

In what proportion of cases is the gallbladder the principle or sole cause of the trouble in so-called gallbladder disease? If this question were definitely answered, one could see his way much more clearly to a decision as between cholecystectomy and cholecys-

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

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2. Williams and Martin: Gray's Anatomy, Spitzka, 1910.
3. Judd and Mann: Surg., Gynec. and Obst., 1917, **24**, 437.
4. Flexner, in Kemp: Diseases of the Stomach, Intestines and Pancreas, Ed. 2, 1912, p. 939.
5. Hohlweg, H.: Am. Jour. Med. Sc., 1913, **146**, 292.
6. Deaver and Ashhurst: Surgery of the Upper Abdomen, 1913, **2**, 115.
7. Moynihan: Abdominal Operations, Ed. 3, Philadelphia, W. B. Saunders & Company, 1914, **2**, 289.

tostomy. Women who have borne children are peculiarly prone to gallstone disease. This is because in pregnancy there is an increase of cholesterol in the blood. This cholesterinemia has been found to continue for some time after the birth of the child.[8] Aoyama[9] has shown by experiments that the administration of cholesterin or oleic acid by mouth causes a deposit in the gallbladder of granules like cholesterin. Rothschild[10] and others have shown that the cholesterin content of the blood depends on the type of food that the organism consumes, and Gerster[11] has recently reported three cases in his own practice which strongly confirms Rothschild's opinion. Henes'[12] studies concerning the cholesterol content of the blood confirm the findings of Rothschild and Gerster. Out of 320 gallbladders removed at Rovsing's[13] clinic 54 per cent. were found as a result of systematic bacteriologic study to be sterile. In cases in which a single large stone is found, the percentage of sterility was 52.7, whereas in the cases with small mulberry-shaped stones the percentage of sterility was 77. Rovsing quotes Boysen as saying that he invariably found that the gallbladder was sound when the gallstones were of the small primary bile-pigment calcium type.

Deaver[14] reports that of seventy-nine patients in the German Hospital with chronic pancreatitis, 91 per cent. showed evidence of infection in the bile passages, while Mayo found that 86 per cent. of 359 cases of pancreatitis were accompanied by gallstone disease.

The experience of Rothschild and Gerster, referred to above, together with that of Rhodes,[15] lends color to the view that in a large percentage of cases presenting symptoms which ordinarily lead to gallbladder surgery, as well as in a large percentage of those not cured by cholecystostomy, the cause of the symptoms lies not in the gallbladder at all but in the bile itself. A careful weighing of the evidence produced seems to force one to the conclusion that disease of the gallbladder itself is relatively rarely the cause of the symptoms for which the so-called gallbladder patient consults the surgeon.

Let us now look at the clinical experience of the various surgeons regarding the relative merits of cholecystostomy and cholecystectomy. In a study made by C. H. Mayo,[16] of 242 cases of cholecystostomy he found that 53 per cent. of the patients were cured, 38 per cent. improved and 9 per cent. not improved. In 219 cases of cholecystectomy the percentage of cures was 71, while 22 per cent. were improved and 7 per cent. not improved. This study shows 18 per cent. of cures in favor of cholecystectomy, while the percentage of improvement is higher in the cholecystostomies by 16. The percentage of those not improved was 2 higher in cholecystostomy than in cholecystectomy.

Clark[17] says that of late years he has resorted to cholecystectomy in a greater proportion of cases because his experience has shown that, if the gallbladder wall is much diseased and the symptoms have been marked and prolonged, this operation gives better results than cholecystostomy.

W. J. Mayo[18] is of the opinion that cholecystostomy may be an efficient procedure in gallstone disease when the gallbladder is normal and the ducts are free, but that in cholecystitis the method is not satisfactory. He is of the opinion that cholecystectomy is indicated in 80 per cent. of the cases of gallstone disease.

Lane[19] says that his experience of the past year is that cholecystectomy is the operation of election for cholelithiasis. Ochsner,[20] on the other hand, says that cholecystostomy is the operation of choice for removal of stones from the gallbladder. Swope[21] reports 96.8 per cent. of cures following cholecystectomy and only 74.8 per cent. of cures following cholecystostomy. In the discussion of Swope's paper, Erdmann of New York said that unquestionably cholecystectomy limits morbidity and increases efficiency, and largely for this reason he announced that for the past year he had been doing cholecystectomy practically in every instance. In discussing the same paper, Keefe of Providence pointed out the fact that morbidity followed after cholecystectomy as well as cholecystostomy, and said that he believed those men who were taking out all gallbladders were doing a great deal of harm.

Deaver[14] says that they believe cholecystectomy should scarcely ever be preferred in simple cases of cholelithiasis, but says that it is indicated in cases, which he notes in detail, wherein the gallbladder is grossly diseased. This author[22] refers to a patient of Dr. Rysen's who at that time was carrying a T tube in the common duct and had been for over two years subsequent to a cholecystectomy, because on two occasions she had experienced recurrence of symptoms after removal of the tube. C. H. Mayo[16] says that the persistence of gastric symptoms after cholecystostomy is evidence that the gallbladder should have been removed.

Hubbard and Kimpton,[23] in a study based on 226 operations, conclude that the failure to obtain a permanent cure in the majority of cases of gallstones is due to the fact that stones have been overlooked and left behind. Certainly this mishap is quite as apt to occur in cholecystectomy as in cholecystostomy. Buchanan,[24] in a paper based on a series of 300 operations on the gallbladder, notes the difference that obtains between operators of large experience in different clinics, and concludes that "cholecystostomy is not a satisfactory operation, as it gives but 81.7 per cent. of ultimate cures; that cholecystectomy would not be satisfactory if employed in all cases by operators of ordinary skill; that there is a field for both operations and that surgeon will have most success who will not only consider the condition of the patient but estimate justly his own capability."

From the foregoing it will be seen that there are those, Lane and Erdmann, for instance, who believe that cholecystectomy is the operation of election for cholelithiasis, and on the other hand those like Ochsner and Deaver who believe that cholecystostomy is the operation of choice for the relief of stones in the gallbladder, and still others of equal experience and skill who seem to occupy a middle ground.

8. Henes, Edwin, Jr.: Surg., Gynec. and Obst., July, 1916, p. 93.
9. Aoyama: Am. Jour. Med. Sc., 1915, p. 764.
10. Rothschild, M. A., and Rosenthal, N.: Am. Jour. Med. Sc., 1916, p. 394.
11. Gerster: Progr. Med., June, 1916, p. 164.
12. Henes: Surg., Gynec. and Obst., July, 1916, p. 91.
13. Murphy: Practical Medicine Series, 1916, **2**, 481.
14. Deaver: Surgery of the Upper Abdomen, 1913, **2**, 323.
15. Rhodes: Surg., Gynec. and Obst., October, 1916, p. 399.
16. Mayo, C. H.: Collected Papers of Mayo Clinic, 1915, **7**, 262.
17. Clark, John G.: Am. Jour. Med. Sc., 1914, **148**, 265.
18. Mayo, W. J.: Am. Jour. Med. Sc., 1914, **147**, 469.
19. Lane, John W.: A Plea for Cholecystectomy, THE JOURNAL A. M. A., Nov. 20, 1915, p. 1794.
20. Ochsner: New Manuel of Surgery, Ed. 4, 1915, p. 517.
21. Swope, L. W.: Am. Jour. Obst., November, 1915, p. 804.
22. Deaver: Ann. Surg., 1915, **62**, 201.
23. Hubbard and Kimpton: Ann. Surg., 1915, **61**.
24. Buchanan: Surg., Gynec. and Obst., 1915, **21**, 499.

We have here a difference of 21.8 per cent. in the results of cholecystostomy as reported by C. H. Mayo and Swope, and a difference of 25.8 per cent. between their results after cholecystectomy. In 1914 Graff and Weinert[25] traced 124 of their cholecystectomies, and found that only 73.4 per cent. were permanently cured, whereas Schultz, in a series of 510 cholecystectomies, had been able to examine only 145 cases, and makes the surprising statement that not one had any evidence of recurrence of the former or any other untoward symptoms. Of course, no one questions the exactitude of these figures. Neither can the discrepancy be accounted for on the ground of difference in skill between the various surgeons quoted. One is forced to the conclusion, therefore, that the difference is accounted for in the different pathologic conditions that were met. The very considerable danger of overlooking stones in the common duct, as pointed out by Kehr, Eisendrath and others, should be constantly borne in mind. A stone in the common duct of a person who still retains his gallbladder is not so great a menace as a stone in the common duct of a person on whom cholecystectomy has been performed.

The important question to decide is not whether cholecystectomy is preferable to cholecystostomy or vice versa, but rather whether in a given case surgical treatment is called for at all, and if so, what particular kind of surgical procedure best fits that case.

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## ABSTRACT OF DISCUSSION

Dr. Howard Lilienthal, New York: I agree with Dr. Porter that operation in any given case should not be performed with a preconceived idea of what one is going to do. So far as the question between the two operations is concerned, I shall say that for more than twelve years I have steadily and persistently removed every gallbladder that was diseased enough to be operated on. Had I had any cause to regret that mode of procedure I would have changed it. I am satisfied with the results of cholecystectomy in my hands and in those of my colleagues at Mt. Sinai Hospital. In Dr. Eisendrath's specimens in the scientific exhibit you will see how absolutely hopeless it is to be sure the stones have all been removed when the gallbladder has merely been opened.

A question of importance is the course to be adopted when, in the performance of another operation, gynecologic, for instance, gallstones are found. The case is not an unusual one. Suppose you are performing an operation for fibroid, perhaps because the patient has complained of gastric symptoms, and a fibroid is present which you think accounts for these symptoms. You examine, as you ought to do, the gallbladder and find stones there. It is at least just as probable that the gallstones caused the gastric symptoms as that the fibroid did. If you take the fibroid out the patient will have to be told that the gallbladder must be removed later on. In such a case I would advise cholecystectomy with the operation for the fibroid deferred.

Dr. H. J. Boldt, New York: I should like to ask Dr. Lilienthal why in such a case as he cited he would leave the fibroid operation and take out the gallbladder. I have had two such cases this week in which I took the gallbladder out with the fibroid.

Dr. Howard Lilienthal, New York: I said that in a patient suffering from gastric symptoms in whom I found a shrunken, diseased gallbladder packed full of stones I would remove the gallbladder at once and leave the fibroid until later. The extirpation of such a gallbladder may be a dangerous operation, and I think it would be unsafe surgery to perform such an operation and the operation for the fibroid at the same time. My reason, in view of this, for removing the gallbladder first is that the gallbladder condition is the more immediately threatening of the two in such an instance, not to speak of its possibly becoming the site of carcinoma later on. I take away that which causes symptoms and threatens life.

Dr. J. H. Carsten, Detroit: In cases such as Dr. Lilienthal referred to there are usually symptoms indicating stomach trouble, and sometimes there is good reason to suspect that all the trouble is with the gallbladder. I tell the patients that if I find the gallbladder diseased, I will operate on that also. In virtually all abdominal cases I explore the stomach and gallbladder regions when I perform a section. I am always prepared to operate on the gallbladder in any kind of a gynecologic operation. So far as the gallbladder is concerned, I have operated on a few in the last twenty-odd years and I do not see why so much should be said about recurrent attacks of gallstones. I cannot operate any better than any one else. I open the gallbladder and drain it because I cannot tell whether the stones are all out. There are sometimes little ones in the wall of the bladder that I cannot detect, and that patient is going to have trouble in the future. If I put in a tube and leave the wound open for a week or ten days, any stones in the gallbladder or in the duct (coming down from the liver) will come out. Quite a few will pass in the course of a week. There is no reason then to expect any recurrence. That is the reason I drain. In the case of the single stone, after removing it I sew up the gallbladder and drop it back and close the abdomen without drainage. In such a case, as a rule, there is no septic infection and no danger of recurrence. When the gallbladder membrane is diseased I think the gallbladder should come out, but these are exceptional cases. The operator should select his cases carefully and perform the operation indicated in the individual case. While a person can live without his gallbladder, I think it is a great deal better to have it in place, doing its work. I think we ought not to be extreme in advocating one operation above another.

Dr. D. C. Strong, San Bernardino, Calif.: Twenty years ago there was a controversy between the medical men and the surgeons as to whether this was a disease for medical or for surgical treatment. We must take into consideration the history of the case, how long it has existed, and the character of the disease preceding the attack. We have been taught that gallstones follow typhoid fever. My experience is that gallbladder disease follows pneumonia. Any digestive disturbance lasting over a considerable time should be seriously suspected of being caused by the gallbladder. If we teach ourselves to look for gallbladder impaction instead of gallstones, we may so teach the medical man; until then we had better not say much to him. In the old case, cholecystectomy is the operation of choice. If we can get the case sufficiently early we may talk about drainage, perhaps. We should take into consideration also the end-results, and such focal infections as we find about the mouth. I have had three abdominal operations for gallbladder disease; in the last the gallbladder was taken out, since when I have had no more trouble.

Dr. J. W. Vaughan, Detroit: I am in accord with Dr. Porter's paper. Formerly I performed a great many cholecystectomies, but have performed fewer since hearing Dr. Judd's paper. It has seemed to me that the resulting dilatation of the common duct with the increased flow of pancreatic juice and bile into a duodenum which very frequently is empty and does not need this increased flow at such a time might do harm. Again, there results obstruction to the action of the sphincter muscle, which Dr. Porter has shown to be a bad procedure. One is apt to get also retrograde infection and a pancreatitis as a result of the dilatation of the common duct. Every case must necessarily be treated according to the indications.

Dr. Miles F. Porter, Ft. Wayne, Ind.: I do not think there ought to be much disagreement, but I must disagree with my friend who has his gallbladder out, on his method of argument. It reminds me a good deal of the man who knew perfectly well that the story of the ark was all right and correct because he had a friend who had given him a stone from Mt. Ararat. That is exactly the sort of an argument which this paper is written to combat. A few weeks before I came here

25. Graff and Weinert, quoted by Buchanan (Note 24).

I performed a second operation on a woman who had had a cholecystectomy, and in that second operation I removed a handful of stones from her dilated common duct. We must not conclude, therefore, that cholecystectomy is always wrong. The point I want to make is that there is overwhelming proof that in man the gallbladder is an important organ; and that, therefore, unless there is a good reason for taking it out, it should be allowed to remain in. On the other hand, I think it is as conclusively proved that in many of theses cases the gallbladder has already been put out of commission by pathologic processes. To allow that sort of gallbladder to remain in an abdomen is to do imperfect work.

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## OBSERVATIONS ON THE EXCRETION OF DYES *

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AND
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The excretion of dyes offers a problem which is of interest from a variety of standpoints. It has a physiologic application on account of the light which it may throw on the functions of the excretory organs, and on the mechanism utilized by the body for the removal of waste material. Pharmacologically, it offers a simple method for the investigation of relationship between chemical structure and excretory function. Finally, it affords the clinician an instrument of precision in determining excretory activity. The method was introduced many years ago in the study of kidney function, and a variety of dyes have been employed for this purpose, of which the one in most general use today is phenolsulphonephthalein. An attempt has been made to study liver function in a similar manner, but the procedure has not proved entirely successful. The present paper reports on certain observations which throw new light on various aspects of the problem.

It has been found that some of the dyes of the diazo series are tolerated in large amount when given intravenously to human beings. We have injected in one dose as much as 1 gm. of Congo red in 2 per cent. solution without apparently disturbing in any way the general bodily equilibrium. The same quantity of trypan red has been given without injurious effect. It is of interest to note that the dye when given in such amounts circulates in the blood for several days unchanged, and may be demonstrated by the discoloration of the serum.

Dyes have been injected into human beings only after a thorough test of their toxicity in animals, the guinea-pig and the rabbit having been chiefly used for this purpose. The toxicity of the various diazo dyes varies markedly, as has been pointed out by Evans. However, there does not seem to be any direct relationship between chemical composition and toxicity. The side-chain theory of Ehrlich, which postulated a special affinity on the part of the cells for certain chemical side-chains of the molecule, is not supported by the facts. Slight variations in composition, such as an alteration in the relative positions of two side-chain groups of the naphthalene nucleus, may result in a distinct change in toxicity. The addition of a single sulphonate group to two such preexisting groups in the molecule, a change of no apparent significance (since there may be five of these groups in a nontoxic dye, such as trypan red) may result in an enormous increase in toxicity; this is true of heliotrope 2B as compared with Congo violet. But at the same time the relative positions of the side-chains in the naphthalene group have been changed. Why this change should so completely alter the reaction of the body is not clear. The physiologic basis of these effects is for the most part quite obscure. It is of importance that the same dye, such as trypan blue, may be considerably more toxic for one species, such as the guinea-pig, than for another, such as the rabbit.

The tendency of the body is to rid the blood of this foreign material. A certain amount is taken up by the cells of the tissues, and these cells then undergo a marked discoloration. Such cells belong to the phagocytic group, and have been called "scavenger cells" by Evans. After intravenous injection into human beings of the Congo red or trypan red, the skin may assume a diffuse reddish color, the intensity of which varies with the amount injected. This discoloration gradually fades away. Inflammatory tissues also have a marked tendency to take up the color. In working with experimental arthritis, Cecil has found that trypan blue lodges in large amount in the tissue of infected joints, and Weil has shown that Congo red produced marked discolorations of the necrotic areas of malignant new growths in human beings. We have found that the dye is also excreted into pleural fluids, and is present in mucopurulent exudation from the respiratory tract, as in bronchitic sputum. We have found that the dyes are excreted on the surface of external ulcerated areas, including both ulcerated new growths and benign lesions, such as chronic varicose ulcers. Congo red, for example, when given in amounts of 0.5 gm. intravenously in human beings, appears on the surface of the ulcer in about an hour, and is then continuously demonstrable for several days. The dye certainly has no injurious effect on the ulcer, and has seemed at times to exercise a beneficial influence on the healing.

The excretion of dyes by external ulcers suggested the possibility that ulcers of the gastro-intestinal tract might perhaps act in similar fashion. We have therefore studied gastric ulcers from this standpoint. Congo red, as we have already reported in a short preliminary paper, was found in the stomach contents of a number of patients with gastric ulcer. In these cases it was usually present in very large amounts, so that the filter papers through which the contents were passed showed a heavy red deposit. In a number of cases of gastric carcinoma the same observation was made. Thus the conditions seemed most favorable for the development of a differential diagnostic test for diseases of the stomach. On the other hand, there were some cases both of ulcer and of cancer which failed to give a reaction, while there were also occasional control cases in which neither ulcer nor cancer was present in which the stomach contents showed a small amount of dye.

In trying to account for the latter group, we found that Congo red is excreted in large amounts in the bile, and that the reflux of bile into the stomach may present a serious complication in the utilization of the method as a gastric test. This fact necessitated the study of dyes in relation to their excretion by the liver. Congo red is the only dye of which the excretion in

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human bile has been directly investigated. A patient with a postoperative biliary fistula, but without any evidence of inflammatory conditions in the biliary tract or liver, received 0.5 gm. of the Congo red intravenously. Within one-half hour the dye appeared in the bile and continued to be excreted by that route for more than twelve hours. If dyes were to be used for the diagnosis of gastric conditions, it appeared to us to be essential to utilize such dyes as were not excreted by the bile, in order that this source of error might be excluded. The method which we employed to determine whether or not dyes were excreted by the liver was to give an animal an intravenous injection, and then after two or three hours to aspirate the contents of the gallbladder. This operation can be carried out on guinea-pigs under ether. The laparotomy wound heals well, and the animals ordinarily recover and become available for a second experiment. The discoloration of the bile offers immediate evidence of the presence of the dye. At times the color of the dye in the bile is somewhat different from that of the original watery solution. Thus Bordeaux COV may have a pinkish instead of a lilac color. Ordinarily, the addition of a few drops of peroxid alters this to the usual color, thus showing that partial reduction is responsible for the change.

It was found that dyes could be divided into three classes with reference to their excretion by the liver. These classes, of course, include only such dyes as were not toxic and could therefore be injected intravenously. In the first group are the dyes which are excreted by the liver and are present in the bile. Among such dyes, in addition to Congo red, may be mentioned neutral red, safranin, methylene blue, Biebrich scarlet, benzo-azurin, and oxamin violet. The second group comprises the dyes which do not appear in the bile. Such are rosanilin, pyronin, trypan red, orange G, eosin, indigocarmin, azur, and a number of others. The third group comprises those dyes which make their appearance in the bile occasionally, but not regularly, when injected in the routine amount of 0.5 c.c. of a 1 per cent. solution; examples of this group are Bordeaux COV, Congo rubin, and azoblue.

The chemical or physical basis of these differences is entirely obscure. Congo Corinth differs from Congo red only in the substitution of an OH for an NH group, yet the former dye is not excreted by the bile, while the latter is.

A series of observations have been made on the excretion of these dyes not only by the liver of normal animals, but of such animals as have received injections of phosphorized oil. In the latter the liver undergoes marked fatty degeneration, and whether the animal dies or recovers depends on the dose. In such poisoned animals the dyes of the first group are excreted in the bile exactly as in normal animals. Those dyes belonging to the second group, which are never excreted by the normal liver, are never excreted by these diseased livers. The dyes of the third group, toward which the normal liver exhibits a certain latitude, are always excreted by the diseased organ. These observations indicate the likelihood of finding some dye, the presence of which in the bile will always indicate a diseased process in the liver; as yet, however, this object has not been accomplished.

For the diagnosis of gastric disease, we have tested some of the dyes in group two, which are never present in the bile. The dye which has been most thoroughly studied in this connection is trypan red. This dye has certain obvious advantages. It is very soluble, is nontoxic on intravenous injection, is excreted promptly and profusely on the surface of external ulcerations, and does not appear in the bile. These characteristics seem obviously to determine its availability for the purpose. It has been employed in a series of nine cases of organic stomach disease, including ulcer of the duodenum, and ulcer or cancer of the stomach, in which the diagnosis was established with certainty, either by operation or the Roentgen ray. In not a single one of these cases has the trypan red ever been found in gastric contents. Here, then, is an absolute difference in the behavior of the dye in skin ulcers and in gastro-intestinal ulcers. It seems difficult to account for this difference on the basis of any differences in the nature of the two types of ulceration, and we are therefore inclined to the view that chemical conditions might be such as to obscure the presence of the dye, even if actually excreted in the stomach. Experiment has indicated that this possibility does, indeed, exist. Dilute hydrochloric acid somewhat decolorizes solutions of trypan red when left in contact therewith. If hydrogen peroxid is added to the mixture, decolorization is complete and much more rapid, yet hydrogen peroxid alone produces hardly any alteration. If we assume that oxidases are present in all the tissues, especially in granulating surfaces, the difference in the coloration between gastric and cutaneous ulcers might conceivably be explained on this ground.

Pyronin has been tried out in cases of gastric ulcer, but also without result.

Experimentation is now under way in the excretion of these dyes by experimental gastric ulcers in dogs, and it is hoped that this method will throw some light on the problematic conditions which we have encountered in human beings.

We desire again to draw attention to the different manner in which the liver behaves toward dyes, excreting some and not others, and to the fact that this function can be modified by disease of the organ; furthermore, to the fact that ulceration of the gastro-intestinal tract appears to act differently as regards the excretion of dyes from ulceration of the skin surface.

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## ABSTRACT OF DISCUSSION

DR. ARTHUR D. HIRSCHFELDER, Minneapolis: This work represents a most ingenious application of a phenomenon which in itself is interesting. A few years ago Dr. M. C. Winternitz and I began a series of experiments on pneumonia in rabbits and found, just as the essayists have found, that trypan blue and trypan red went almost specifically into the diseased tissues, so that they marked off diseased areas of the lung and would also go into the fibrinous exudate of a pleuritis or a pericardial effusion. These dyes were absorbed by fibrin, but entered everywhere into diseased tissue. Similar observations were made by Camp and Bell in Minneapolis for other local infections, and we also have been in the habit of using injections of trypan blue to mark off burned areas or areas otherwise injured. I think it represents as sure a method as one could desire for the detection of necrotic areas, but the applications that Drs. Weil and Cecil have made—to use this for the excretion through ulcerated surfaces—is extremely interesting and, I hope, practical. One point, which probably has also occurred in the experience of Drs. Cecil and Weil, which struck us in working with trypan blue in general is the variability of the toxicity of the benzidin dyes based on their colloidal state. If we allow the trypan blue to stand for a short time the dispersion or suspension of the dye is apparently changed. The ordinary suspension or solu-

tion of trypan blue represents a molecular weight which is about four times the theoretic molecular weight. If allowed to stand, definite visible aggregates occur. The longer it stands the greater the toxicity. This is important in the practical application of the dyes of the benzidin group. They must be used with distilled water and very fresh solutions must be used or toxicity will result.

DR. ROBERT A. HATCHER, New York: Dr. Weil informed us that the liver of the dog poisoned with phosphorus does not behave toward certain dyes as does the liver of the normal dog; hence we investigated the capacity of such poisoned livers to remove strychnin from the circulation and destroy it. Dogs were given phosphorus and when moribund the liver was excised and perfused with a solution of strychnin. The results were practically identical with those obtained with normal livers.

DR. FRED I. LACKENBACH, San Francisco: Another interesting field of investigation is the use of these dyes as therapeutic agents. There has been some work done with fuchsin in the treatment of tuberculosis of the bladder and kidney and in gonococcus infections. Dr. Vecki published a paper about a year ago on the employment of fuchsin solution in strengths of 0.25 to 1 per cent. for irrigating the bladder and urethra. It is important to use the solutions as fresh as possible and fuchsin of high purity; it is otherwise irritating. While the literature on the subject is not large, it is interesting and should stimulate investigation.

DR. OTTO RAUBENHEIMER, Brooklyn: From a historic standpoint it is interesting that the "pigmentarii," or color makers, of old Rome have been revived in our present age. In regard to the excretion of dyes I would say that in 1910 a number of samples of urine were brought to me with a bluish cast, and many physicians were puzzled. One woman brought around a pot of urine and some physicians considered it indican; but this is not blue, and indican must be oxidized to develop the blue color. The color was due to the administration of some proprietary pill which was distributed at that time and which contained methylene blue. This urine was left standing three months and then, to my surprise, it was not putrid but was well preserved and, very strange, was colorless. On loosening the cork and shaking it the urine developed a blue color. This may be new to some of the members of the section.

DR. WILLIAM SALANT, Washington, D. C.: The study of the elimination of dyes is a very good field for the pharmacologist and the medical man. I have been interested in it for some time and have examined a number of water-soluble and fat-soluble dyes with reference to their elimination. I was impressed with the fact that elimination by the liver in animals poisoned with hydrazin was the same as in normal animals. I think, however, some dyes will be found the elimination of which in the bile is different when the liver is normal and after it has undergone pathologic changes. The fact that in inflammatory conditions staining of certain organs with some dyes has been observed, whereas the same organs when normal remain unaffected by such dyes, is, I think, promising, for it may prove of value in the diagnosis of hepatic diseases.

DR. RUSSELL L. CECIL, New York: As to the possible toxicity of these solutions, we have injected about sixty to seventy patients intravenously and in only one did we get symptoms of toxicity, and this was, I think, because we allowed the solution to get cold. It is true that our solutions must be made up fresh with distilled water, and in using the concentrated solution it is desirable to keep it warm. This patient's temperature rose to 103 F., with chills, but the symptoms passed away in a few hours. As to the therapeutic effect, we tried one case of ulcer of the leg with granulating edges the size of a dollar which had been treated by various methods a year or two, and by constantly injecting the dyes the patient's eyes got very red, but he said he would rather be red than have the ulcer, and we injected time and again. The ulcer improved under the treatment but the patient got restless and in five or six weeks we let him go home. As to the cosmetic effect, in the anemic patients we get a wonderful color which will not rub off.

# AN APPARATUS FOR THE STUDY OF THE DISSOCIATION OF OXYHEMOGLOBIN *

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The work of Bohr, Barcroft and others has shown the importance of electrolyte contents, reaction, etc., in connection with the power of hemoglobin to absorb oxygen when exposed to this gas at different pressures. Determinations of the amount absorbed at successive low pressures of oxygen give a characteristic curve which is modified by various changes in the medium in which the hemoglobin is dissolved or suspended, and it seemed possible that the comparison of such curves, made with blood in which the nature of changes in the plasma were known, with others made from normal blood might give a clue as to the abnormality of the plasma. There are many other directions in which such determinations might be useful.

Barcroft's instrument allows a direct comparison between the amount of oxygen absorbed by a cubic centimeter of blood at a low oxygen pressure with that absorbed at the point of saturation. It appears to give no absolute or quantitative result, so that it would be difficult to follow daily changes in the blood, except by comparison with some standard.

With the idea of securing absolute rather than relative figures, the apparatus herein described was planned. It is, as the drawing shows, simply a modification of Van Slyke's apparatus for measuring the combining power of the blood for carbon dioxid. The modification consists essentially in lengthening the stem which is narrowed above and below, and graduating this stem throughout. The narrow parts, above and below the central wide tube, contain each 2 c.c., the graduation being in twentieths of a cubic centimeter. The broader part of the tube contains 48 c.c. graduated in tenths, so that the apparatus from the upper tap to the beginning of the lower narrowed portion contains 50 c.c.

A centimeter scale is fixed close to the glass apparatus, which itself is clamped in such a way as to occupy always the same position. The mercury bulb is supported in a ring which is raised or lowered by a cord that passes over a pulley to wind on a drum which can be turned by hand by the attached wheel. Close to it is fastened another centimeter scale. Since it is difficult to read the level of the mercury in the bulb against the scale, a float is arranged with a needle which plays directly on the scale and is adjusted to indicate the figure which corresponds with that read on the other scale from the level of the mercury in the glass apparatus when the taps are open to the atmospheric pressure.

By filling the apparatus with mercury, closing the upper tap, and lowering the mercury bulb, one may read off the barometric pressure by comparing the levels of mercury read from both scales. When the interior of the tube is wet, the barometric reading is lowered on account of the water vapor. The degree of lowering is practically constant with the small amount of fluid, and the wet barometric reading is used throughout, since all measurements must be made

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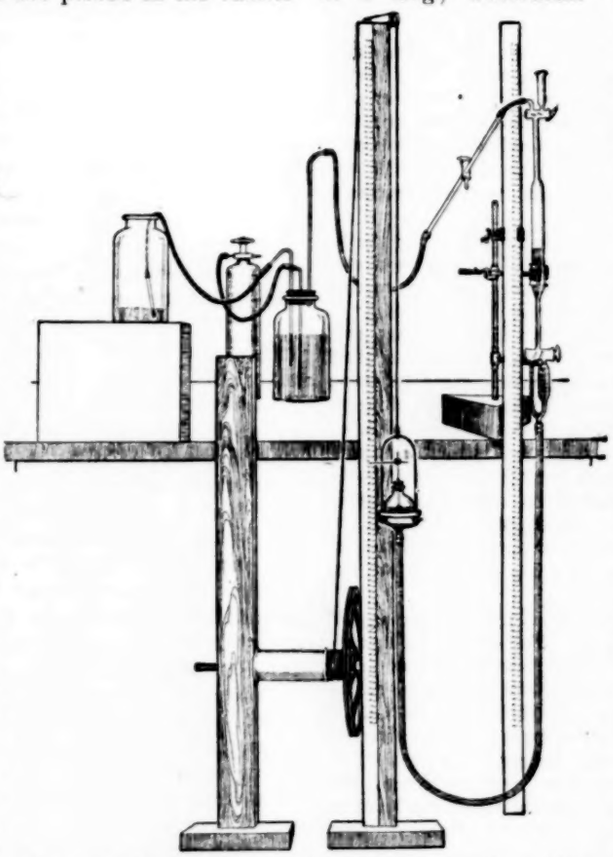
* Read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

in the presence of water vapor. Doubtless, this is one point which may be criticized, but it is thought that the error is one which admits of correction throughout.

To estimate the capacity of hemoglobin to absorb oxygen, defibrinated blood is exposed in the apparatus at a definite temperature, to oxygen at varying pressures below 100 mm. of mercury. Complete saturation occurs at pressures above 100 mm. under almost any circumstances of temperature or change in plasma constitution, so that the characteristic variations are found at pressures below that point. The absorbed oxygen is then liberated by the ammonia-ferricyanid method of Haldane, and measured.

The whole procedure is carried out in the same apparatus. Two c.c. of blood are placed in the funnel at the top, the whole tube being filled with mercury, and are drawn into the tube by way of the tap. No air is allowed to enter and the mercury is lowered to the graduation at 50 c.c. There is much frothing of the blood, which becomes very dark in color, especially when the apparatus is removed from the clamp and shaken. Replaced in the clamp, the mercury is raised and the liberated gases allowed to escape through the funnel. This exhaustion is repeated until no more gas is liberated except a minute bubble of about 0.05 c.c. which is constant and represents water vapor. That this removes all free oxygen is readily shown by allowing ammonia and ferricyanid to run in with such exhausted blood, after which there is no further liberation of gas.



Apparatus for determination of dissociation of oxyhemoglobin.

The exhausted blood is drawn down into the reservoir below the lower tap, and mercury allowed to run up through the other tube by turning the tap quite around until the apparatus is filled. Oxygen is now run in through the tube above the upper tap and the mercury lowered to 50 c.c. This oxygen is expelled by raising the mercury and turning the three-way tap in the tube from the oxygen apparatus, so that it escapes. When this tap is again turned, so that oxygen runs into the apparatus, only a small amount is allowed to enter, and the upper tap is closed. Then the mercury is lowered to the 50 c.c. mark, and the comparison of the two levels of mercury as read on the two scales gives the pressure at which the oxygen stands. It must be observed that here, too, the differences between the two readings are subtracted from the wet barometric reading. One may accept the pressure which comes by chance and which may be 23 or 39 mm. of mercury, or one may repeat the operation until the reading is exactly 20 or 30 mm. of mercury. It is a matter of no importance, since all readings are equally useful in constructing the curve; but it may be of interest to compare successive readings at the same pressure of oxygen.

The mercury is now further lowered to the lowest mark on the narrow portion of the tube, so that the oxygen is now expanded to 52 c.c. and is naturally at a different pressure. But the original pressure is restored by turning the tap slowly, so as to allow the 2 c.c. of exhausted blood to float up to the top of the mercury and occupy the extra 2 c.c. of space. All taps are now closed and, since 2 c.c. of exhausted blood are exposed to 50 c.c. of oxygen at, say, 20 mm. pressure, the apparatus is removed from the clamp and shaken. This shaking is done at a constant temperature, 37 C., the apparatus being submerged in a large waterbath. After ten or fifteen minutes' vigorous shaking, it is placed once more in the clamp, and by raising the mercury the remaining oxygen is driven out through the funnel at the top. This process may be repeated, but it does not seem to be necessary to repeat it.

After all the oxygen has been expelled, 5 drops of octyl alcohol and 6 c.c. of ammonia (a dilute solution made by adding 1 c.c. of strong ammonia to 200 c.c. of distilled water), together with a little saponin to lake the blood, are drawn into the funnel. This is followed by 1 c.c. of fresh saturated solution of potassium ferricyanid. The mercury is lowered to the bottom of the tube and the whole shaken. When all the gas has been liberated, the fluid is drawn down into the reservoir and the tap turned round, so that the mercury may run up through the other tube, driving the gas up into the narrow portion at the top. The mercury in the bulb is leveled with that in this tube and the amount of gas read off. When this is recorded, similar estimations are made for other pressures of oxygen.

The method seems reliable and gives readings comparable with those of Barcroft and Bohr. There are many small technical difficulties which are overcome by practice, especially in the manipulation of the taps, so that blood shall not be allowed to escape or to come into contact with the air after its exposures to oxygen. It is possible to avoid this fairly well by placing a little petrolatum in the bottom of the funnel, but it must be remembered that petrolatum will dissolve and allow the passage of oxygen rather quickly. Corrections are made for temperature, pressure and water vapor.

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**Man and Freedom of Will.**—Man loves to act as he likes, and not necessarily as reason and self-interest would have him do.—Dostoievsky.

# EDEBOHLS' OPERATION IN NEPHRITIS IN CHILDREN *

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Edebohls, in reviewing the clinical records of the patients on whom he had performed nephropexy, found that six of them had also had chronic nephritis. The complete and permanent disappearance of albumin and casts from the urine and the restoration to perfect and enduring health of three of the first five patients, led him to advise bilateral nephropexy in the sixth patient, a sufferer from chronic Bright's disease complicated with movable kidneys, mainly with the object of favorably influencing the chronic nephritis. This operation, performed Jan. 10, 1898, constituted the first operation ever undertaken on the kidneys with the deliberate purpose of curing chronic Bright's disease. The paper in which he reported this case and stated his views was published in 1899.[1]

In May, 1901, Edebohls[2] stated that he was prepared to go a step farther and to propose surgical intervention for the purpose of attempting a cure of chronic nephritis, whether the affected kidney was movable or in place. When the kidney was movable, he advised nephropexy with denudation of the kidney, and when it was fixed, denudation of the kidney of its capsule proper, thus affording free opportunity for the formation of new vascular connections on a large scale between the blood vessels of the kidney and those of its fatty capsule.

In 1901, he published an article[3] in which he reported eighteen cases of chronic Bright's disease in women between the ages of 19 and 45 years. In some cases, the disease was unilateral, in others, bilateral. In most instances, it was interstitial in type. In his early operations, he did not excise the whole capsule; in his later operations, he did. He states that excision of the renal capsule proper accurately defines the operation. Eight of nine patients, operated on a year or more before, were cured, while the outcome in the other patients was encouraging. He believed that these results proved that chronic Bright's disease is curable by operation. He stated that the first beneficial effects of the operation, which are shown by an increase in the flow of urine, do not appear before the tenth day.

He explained the good results of the operation on the basis of the conditions found at a second operation on a patient in whom nephropexy had been performed. Strong connective tissue adhesions or bands attached the kidney to its surroundings. These bands contained very large and numerous blood vessels running between the kidney and the adjacent tissues. There was a large excess of newly formed arteries over newly formed veins. In all the arteries the direction of the blood stream was toward the kidney. He concluded, therefore, that "arterial hyperemization of the kidney is the basic factor underlying the subsequent changes which result in the cure or improvement of chronic Bright's disease after operation."

Edebohls believed that the increased and adequately maintained blood supply to the kidney established by the operation leads to gradual absorption of the interstitial or intertubular inflammatory products and exudates, thus freeing the tubules and glomeruli from external compression, constriction and distortion, and permitting the reestablishment in them of a normal circulation. The result of this improved circulation in and between the tubules and glomeruli is the regenerative production of new epithelium capable of carrying on the secretory function.

He stated that it is self-evident from the above considerations that the cure of chronic Bright's disease is initiated only by the operation, and that it is thereafter necessarily gradual and progressive. It is not a question of the simple relief of renal tension, the beneficial effects of which in acute conditions of the kidneys were described by Harrison in 1896. In these acute cases, the tight fit of the capsule proper is manifest and the kidney bulges at once through an incision or puncture made through the capsule. In chronic Bright's disease, on the contrary, the capsule proper, although it may be abnormally adherent to the kidney, never compresses the latter and may rest loosely on it. Moreover, on cutting the capsule proper, the edges of the incision do not gape.

Edebohls stated that the object of renal decapsulation is to create new and liberal supplies of arterial blood to the diseased kidneys. Both the denuded kidney and its fatty capsule are most liberally supplied with blood vessels. Both are brought together by the operation over the whole extent of the surface of the kidney. The necessary result must be the formation, on the most extensive scale, of new vascular connections between the kidney and the fatty capsule about it. The fibrous capsule proper forms an almost impenetrable barrier to the passage of blood vessels between the kidney and its fatty capsule. He also said that it must be remembered that renal decapsulation is not directly and forthwith curative of chronic Bright's disease, and that it only leads to a cure or improvement of the disease by establishing circulatory conditions essential to such cure or improvement. The attainment of permanent cure will necessarily require time.

In 1904, he admitted that the experimental evidence as to the formation of new vessels was conflicting. He asserted, however, that the results obtained were unimportant and inapplicable, because all the experimental work had been done on animals with normal kidneys or with acute nephritis, and no studies were made on animals with chronic nephritis, which condition he was describing.

He said that Dr. Larkin had made a very complete and careful examination of two kidneys of the same subject, four months after decapsulation, and was able to establish clearly the existence of an abundant vascularization of the new capsules, of direct connection between the vessels of the new capsules and the perinephritic fat, and of direct penetration of the newly formed vessels of the new capsule along connective tissue paths into the substance of the kidney.

In 1904, Edebohls[4] summed up his results in seventy-two patients operated on before Jan. 1, 1904.

* Read before the Section on Diseases of Children at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

1. Edebohls: Med. News, 1899, **74**, 481.
2. Edebohls: Med. Rec., New York, 1901, **59**, 690.
3. Edebohls: The Cure of Chronic Bright's Disease by Operation, Med. Rec., New York, 1901, **60**, 961.
4. Edebohls: The Surgical Treatment of Bright's Disease, New York, F. L. Lisiecki, 1904.

The time elapsing after operation varied from eight months to eleven years and eight months, the average being two years and ten months.

RESULTS OF OPERATIONS IN FIRST SERIES OF CASES

Three patients had disappeared from observation.

Seven had died within two weeks.

Twenty-two had died later, nine from causes not related to chronic nephritis, thirteen could be fairly ascribed to chronic nephritis. Average duration of life was thirteen months, extremes fifteen days to eight years after operation.

Forty were living; of these, three were unimproved, twenty improved and seventeen cured. The duration since the operation in the cured cases varied from sixteen months to eleven years and eight months, the average being four years.

Only one of these patients was a child; a girl of 4½ years. The diagnosis was chronic parenchymatous nephritis. She was well two and one-half years after operation.

In June, 1908, Dr. Edebohls made his final report on 102 patients operated on up to June, 1906.[5] He died Aug. 8, 1908.

RESULTS IN SECOND SERIES OF OPERATIONS

Three patients had disappeared from observation.

Ten had died within two weeks.

Thirty-nine patients had died later, ten from causes not related to chronic nephritis, twenty-nine from chronic nephritis. Average duration of life after operation, seventeen months; extremes, fifteen days and eight years.

Fifty patients were living; of these, six were unimproved, eleven improved and thirty-three cured. Average duration after operation five years; extremes fifteen months to fourteen years and ten months.

Average length of time after operation at which urine became normal, interstitial nephritis six months; parenchymatous nephritis fourteen months.

REVIEW OF LITERATURE REGARDING EDEBOHLS' OPERATION

Edebohls' views and statements attracted a great deal of attention when they were advanced. Van Cott[6] attacked them severely and called attention to the fact, which is unquestionably true, that the blood supply of the kidney comes from the renal artery and that these arteries are terminal arteries, the blood supply from the capsule being insignificant. He also explained that the renal tissue once destroyed does not regenerate. The following are quotations from his article:

> On teleological grounds, the renal circulation cannot be restored by decapsulation and substitution of the capsula adiposa . . . No amount of restoration of renal circulation would restore the integrity of the cortex . . . Chronic nephritis, being a local expression of a general disease, will yield only to such treatment as is calculated to cure the general disease; and here there can be hope only of arresting the progress of the renal degeneration. The diseased portion of the organ will never regenerate.

His arguments as to the circulation of the kidney and to lack of regeneration of kidney tissue seem incontrovertible.

Many experiments were undertaken in all countries on animals in relation to the formation of a new capsule with a new blood supply. Most of the experiments demonstrated that a new capsule is formed very shortly, usually being complete in a few weeks, and that this capsule is thicker and denser than the normal capsule. The experiments were all done on normal animals or on animals with an induced acute nephritis. None of them were studied over long periods of time, a few months being the limit. Most of the observers, outside of Italy, came to the conclusion that the new capsule contains less rather than more blood vessels than the old. Among these writers may be mentioned Johnson,[7] Emerson,[8] Hall and Herxheimer,[9] Ehrhardt,[10] Gifford[11] and Stern.[12] They were unable to find evidences of anastomosis between the new capsular vessels and the other vessels of the kidneys.

Asakura[13] was inclined to favor Edebohls' contention and to believe that the circulation may be improved in chronic conditions. He advanced no evidence, however, to prove this. Zaaiger[14] concluded, from his second series of experiments, that the new capsule had a higher functional worth than the normal, especially on the hilum side. The venous anastomosis was greater than the arterial. He thinks that it is possible that these results may apply to decapsulation in man.

Martini[15] called attention to the fact that a considerable proportion of the circulation in the kidneys comes through the capsules and the anastomoses between the capsular vessels and the others. He believed it theorectically possible, therefore, to establish the circulation through the capsule. He believed that the new capsule was formed from the interstitial connective tissue and the blood vessels of the kidneys. Other writers agree with him. Still other students believe that the capsule is formed from the outside tissues. Martini found a new formation of vessels in the new capsule and that the new collateral blood supply was much richer than the original and the new capsule more vascular. He showed by experiments that, if decapsulation was accomplished some time previously, those dogs would survive operations on the renal vessels while other dogs that had not had their kidneys decapsulated would not recover.

Siter,[16] experimenting on cats and dogs, wrapped the kidney in the omentum. He found that the kidneys increased in size, that a new capsule was formed immediately and a new collateral circulation established in ten days. This new collateral circulation was sufficient to allow the kidney to functionate properly when the renal blood vessels were tied off. The kidneys remained much enlarged. Such a formation of anastomoses between the new vessels of the capsule and the other kidney vessels is, however, according to physiologists and pathologists, impossible.

Murard[17] writing in 1913, called attention to the conflicting results of previous experiments and gave a few of his own. He reviewed the work of other writers, especially in relation to experiments with injections, either through the renal arteries or into the aorta with the renal artery tied. Thelemann[18] injected the renal artery and found no injection of the capsular vessels. Stern[19] found a little color in a few of the extrarenal vessels, but thought that the communications were slight and unimportant. Stursburg,[20]

5. Edebohls: Tr. Sect. Surg. and Anat., A. M. A., 1908, p. 707.
6. Van Cott: Renal Decapsulation from the Pathologist's Point of View, Med. News, 1904, **84**, 970.
7. Johnson: Ann. Surg., 1903, **37**, 592.
8. Emerson: Tr. Assn. Am. Phys., 1903, **18**, 192.
9. Hall and Herxheimer: Brit. Med. Jour., 1904, **1**, 819.
10. Ehrhardt: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1904, **13**, 281.
11. Gifford: Boston Med. and Surg. Jour., 1904, **151**, 37.
12. Stern: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1905, **14**, 601.
13. Asakura: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1903, **12**, 602.
14. Zaaiger: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1906, **15**, 421.
15. Martini: Arch. f. klin. Chir., 1906, **78**, 619.
16. Siter: Tr. Am. Assn. Gen. Urin. Surg., 1913, **8**, 293.
17. Murard: Lyon Chir., 1913, **10**, 347.
18. Thelemann: Deutsch. med. Wchnschr., 1904, **30**, 538.
19. Stern: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1905, **14**, 601.
20. Stursburg: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1903, **12**, 625.

on the other hand, found that injections into the aorta, with the renal artery tied, penetrated deeply into the kidneys, even to the papillae. Murard concluded that, from the standpoint of efficient circulation, decapsulation is a useless operation.

### PATHOLOGIC REPORTS

These are very few, being limited, as far as I found in the references which I looked up and which seemed likely to contain such reports, to those reported by Edebohls himself and three other writers. Boyd and Beattie's[21] patient died four months after the decapsulation of one kidney. The necropsy disclosed a dense new capsule. The capsule was vascular and contained vessels which appeared to anastomose with the vessels in the superficial part of the cortex of the kidney. These writers state, however, that "it is doubtful whether the formation of these new vessels could more than compensate for the normal communication between the renal and perirenal vessels, which was ruptured by the operation of decapsulation." The new capsule formation was accompanied by prolongations of new fibrous tissue into the cortex of the kidney. The interstitial changes present before the operation were thus exaggerated.

Gatti[22] performed double decapsulation in an adult patient who died twenty months later from nephritis. At necropsy the capsule was found to be thicker than normal, fibrous, compact and with few blood vessels.

Boinet[23] reports the necropsy on an adult patient who died twenty-eight and one-half months after a double decapsulation. There was a new, thick capsule which was but little vascularized. There were fibrous prolongations into the kidneys, contraction of which had tended to increase the process. No new vessels were seen passing into the kidney.

### EDEBOHLS' OPERATION IN ACUTE NEPHRITIS IN CHILDHOOD

With the exception of a few who had puerpural eclampsia, Dr. Edebohls' patients all had some form of chronic nephritis. Harrison, however, had begun to operate, in one way or another, on patients with acute nephritis before Edebohls did his first operation for chronic nephritis. Harrison[24] reported, in 1896, three cases cured by operation; one of acute nephritis caused by scarlet fever, another following exposure to cold and damp, and one of subacute nephritis, secondary to influenza. He did not decapsulate the kidneys in these cases, however, but either incised or punctured the kidney or its capsule, or both. He believed that the good results were attributable to the relief of renal tension. In a second article,[25] this writer proposed incision in acute suppression of urine and in acute nephritis with tenderness on pressure over the kidneys and slow disappearance of casts and albumin. He later reported[26] three more cases in which he incised the kidneys for acute conditions in order to relieve tension. It is noteworthy that Harrison's object in incising the kidney was to relieve tension in acute conditions, while Edebohls proposed to promote the formation of a new circulation in the kidney by the removal of the capsule.

I do not know how generally Harrison's advice as to incising the kidneys in acute nephritis was followed, but, from a rather superficial review of the literature, I am inclined to think that little attention was paid to his suggestions and they were soon forgotten. Edebohls' work on the decapsulation of the kidneys in chronic nephritis naturally called attention to the possibility of performing this operation in acute nephritis for the relief of tension, instead of incising the kidneys, as advised by Harrison. I have found three cases described in which decapsulation was performed in acute nephritis for the relief of tension, and do not doubt that I may have missed a few other reports.

### REPORT OF CASES

CASE 1.[27]—Boy, aged 5 years, had scarlet fever, with anuria for four days. The operation consisted of decapsulation and puncture of kidneys. The kidneys were not large and did not protrude when capsule was split. Patient began to pass urine almost at once and recovery was uneventful.

CASE 2.[28]—Boy, aged 12 years, had scarlet fever with convulsions and followed by blindness and deafness. There was almost complete suppression of urine, which revealed presence of blood and casts.

The kidneys were very large with a capsule not adherent, so that the kidney bulged through the slit. Patient passed 24 ounces of urine in 24 hours after operation. Sight and hearing returned on third day, and he left the hospital on the eighteenth day, feeling well.

No note was made as to condition of urine.

CASE 3.[29]—In a girl, aged 6 years, acute symptoms continued for a few days with anuria, convulsions and uremia. Urine contained much albumin but no data were recorded concerning sediment. The operation of decapsulation and incision of right kidney was made. The size of the kidney was not noted, but it bulged through wound and microscopically revealed swelling and exudation in glomeruli and fatty degeneration of epithelium of the convoluted tubules. Patient began to pass urine in a few hours and symptoms of uremia ceased. Five weeks later the patient was symptomatically well and urine contained a little albumin but no renal elements.

The kidneys of two of my own patients who had acute nephritis, suppression of urine and severe symptoms of uremia were decapsulated. The histories of these cases are as follows:

CASE 4.—Boy, aged 13 years, had an attack of tonsillitis, Feb. 10, 1917, which cleared up rapidly. He was nauseated, February 17, and February 20, the urine was scanty, smoky and contained 1.5 per cent. of albumin. The sediment contained large amounts of both normal and abnormal blood, many cells, and many hyaline, granular, epithelial and blood casts. He had a slightly elevated and irregular temperature. Under careful treatment, the urine increased from 3 ounces to 42 ounces, March 7, and the character of the urine also improved, with the amount of albumin going down to 0.1 per cent. At this time, however, although passing urine freely, the patient began to be a little edematous and the urine again became bloody. The amount of urine gradually diminished and the amount of albumin increased. In spite of cutting down the fluid intake and moving the bowels very thoroughly with salts, he began to vomit and the edema increased. March 22 he passed 10 ounces of urine and had fourteen loose stools. At 6:30 a. m., March 23, he had a convulsion. In spite of free catharsis and hot packs, the convulsions continued and there was almost complete suppression of urine, only 6 ounces being passed from that time until the kidneys were decapsulated at 9 p. m. by Dr. James S. Stone. The kidneys were distinctly enlarged, but were more edematous than congested. They bulged somewhat when the capsule was split and the lack of bleeding was very marked. Their appearance was more like that of large, white kidneys than of acute

21. Boyd and Beattie: Edinburgh Med. Jour., 1905, N. S., **17**, 337.
22. Gatti: Arch. f. klin. Chir., 1908, **87**, 658.
23. Boinet: Arch. gén. de méd., 1905, **1**, 660.
24. Harrison: Lancet, London, 1896, **1**, 18.
25. Harrison: Brit. Med. Jour., 1896, **2**, 1126.
26. Harrison: Brit. Med. Jour., 1901, **2**, 1125.
27. Schmidt: Deutsch. Ztschr. f. Chir., 1905, **78**, 296.
28. Harding, G. F.: Decapsulation of Both Kidneys for Acute Nephritis Following Scarlet Fever, THE JOURNAL A. M. A., July 10, 1909, p. 117.
29. Gümbel: Deutsch. med. Wchnschr., 1911, **37**, 594.

nephritis, and there was practically no bleeding from the organ, the denuded surface not oozing at all. There was, however, considerable edema about the kidneys and in all the tissues of the back. The patient continued in convulsions for an hour after the operation, then quieted down and died at 11:15 p. m. He did not begin to pass urine at all.

Case 5.—Boy, aged 10 years, had an acute attack of tonsillitis, Feb. 24, 1916. A week later it was noticed that his face was swollen and that the urine was dark in color and diminished in amount. Since then the swelling had become general and he vomited practically everything taken. He was admitted to the Children's Hospital, March 17. Physical examination revealed moderate, general edema and a small amount of ascites. He passed 17 ounces of urine during the next twenty-four hours, and the urine was reddish-brown and contained a trace of albumin. The sediment contained many leukocytes, a moderate number of red corpuscles, and a considerable number of hyaline and blood casts. During the next twenty-four hours he became stupid, had headache, and passed no urine at all. The systolic blood pressure was 160 and the diastolic 104. A double decapsulation was performed, March 19, by Dr. C. S. Mixter. The kidneys were much enlarged, slightly paler than normal; bulged through the incision and the capsule was stripped off easily. The patient passed 8 ounces of urine during the night after the operation. The amount of urine steadily increased, the blood pressure gradually diminished, and beginning March 22, the patient felt well. The phenolsulphonephthalein test, made March 29, was 71 per cent. It had not been done before the operation. April 9, the systolic blood pressure was 90 and the diastolic, 60. At this time the patient was receiving 36 ounces of fluid and passing 27 ounces of urine daily, which contained a slight trace of albumin, a few casts, but no blood.

The patient was discharged from the hospital, May 3, in good physical condition. The urine then contained a faint trace of albumin and the sediment showed a few hyaline and granular casts. His urine continued to show a trace of albumin for two months, although no casts or renal elements were to be found in the sediment. No albumin was present in the urine after this time, although it was repeatedly examined. When last examined in April, 1917, more than a year after the operation, he was perfectly well and his urine was normal. The operation in this case undoubtedly saved his life and gave Nature the opportunity to heal the acute condition in the kidney.

The results of decapsulation of the kidneys in these acute cases are certainly most encouraging. It seems reasonable to believe that all of these children would have died in a few hours, if the operation had not been performed. If this is true, it is evident that the operation saved the lives of four of them, at least for the time being. Except in the case in my own practice, there are no data on record as to whether recovery was complete. In this instance, the boy, at the expiration of a year, is not only symptomatically well, but his urine is normal and has been for some time.

The explanation of the good results obtained by decapsulation of the kidneys in nephritis with suppression of the urine and symptoms of uremia is plain. Under these circumstances, the kidneys are in most instances engorged with blood and as the result, become enlarged. The capsule stretches to a certain extent, but, after a time, further distention becomes impossible and the circulation is then so much impeded that the excretion of urine is impossible. The tension of the capsule and the compression of the kidney are shown by the manner in which the capsule splits apart and the kidney bulges through the wound, when the capsule is incised. The relief of the tension afforded by the decapsulation results in a diminution of the engorgement of the kidneys, an improvement in the circulation and, in favorable cases, the restoration of the excretory function. It is possible that simple incision of the capsule might be as effectual as decapsulation. It does not seem likely, however, because decapsulation should relieve the tension more completely than simple incision. It is possible that the manipulation of the kidney, which necessarily takes place during the operation, may be beneficial in relieving the congestion and starting up the excretion.

Decapsulation of the kidneys in acute nephritis does not remove the cause of the disease or affect in any way the essential pathologic process in the kidneys. It merely relieves the extreme congestion, which is in many cases the cause of the threatening symptoms, and, except for this, leaves the kidneys as they were before the operation. Hence, the chances of death, of complete recovery or of the development of chronic nephritis are the same as in other cases of acute nephritis in which symptoms due to extreme congestion have not developed. Decapsulation of the kidneys should be undertaken in acute nephritis, therefore, only in those cases in which there is a marked diminution in the amount of urine and symptoms of intoxication are developing. Under these conditions it is not infrequently a life saving operation. It seems only reasonable, therefore, to give every patent the chance which operative treatment affords.

### EDEBOHLS' OPERATION IN CHRONIC NEPHRITIS IN CHILDHOOD

All of Edebohls' patients, with one exception, a girl, 4½ years old, were adults. In a fairly careful search through the literature, I have been able to find nineteen cases of subacute and chronic nephritis, including Edebohls' own case, in which decapsulation of the kidneys has been done.

[The abstracts of these cases are omitted because of lack of space.]

### SUMMARY OF NINETEEN CASES OF SUBACUTE OR CHRONIC NEPHRITIS IN WHICH DECAPSULATION OF THE KIDNEYS WAS PERFORMED

Dead: Four patients died after 5, 6, 15 and 18 days.

Cured: Three patients seen last after 4 months, 6 months and 9 years.

Cured, but recurrence: One patient well and urine normal for 2 years; recurrence, with second operation and death in six weeks.

Not improved: Two patients living after 5 weeks and 6 months.

Improved: Two. First patient better for one year, but acute excerbation and death in two weeks; second, improved, but died of bronchopneumonia after four months.

Symptomatically well, but urine containing albumin and casts: Seven patients, after 4½ months, 6 months, 8 months, 10 months, 1 year, 1 year, and 6 years.

I have had decapsulation of the kidneys performed in four cases of chronic nephritis of the parenchymatous type. The histories of these cases are as follows:

Case 24.—A boy had acute nephritis at 3 years of age as the result of tonsillitis. He was treated in the Children's Hospital at this time and was discharged after five weeks symptomatically well. The urine contained no albumin, but the sediment showed a few hyaline and fine granular casts. He came to the outpatient department at intervals for various slight symptoms during the next three years. His general health was good. The urine was examined three times during this period. It did not contain albumin. The sediment was not examined. Three days before his entrance to the Children's Hospital, Aug. 7, 1915, when 6 years old, his face became puffy and he was nauseated. On admission there was marked edema of the face, moderate edema of the lower back, and slight shifting dulness in the abdomen. The urine contained

a large trace of albumin and many hyaline and granular casts. The phenolsulphonephthalein test showed an excretion of 62 per cent. in two hours. The systolic blood pressure was 110; the diastolic, 85. In spite of careful treatment, the patient became worse. The ascites and edema increased and he failed rapidly in general condition, but showed no symptoms of uremia. The urine was diminished in amount and continued to contain a large amount of albumin and many hyaline and granular casts. The phenolsulphonephthalein excretion was, however, somewhat better, being 71 per cent. Decapsulation of the kidneys was performed by Dr. Charles S. Mixter, Oct. 9, 1915. The kidneys were slightly enlarged and of about normal color, not the color of the typical white kidney. The capsules stripped off easily. During the first week after the operation, the edema and ascites increased enormously and he passed only one-half as much urine as he received of liquid. At the end of a week, he had a severe convulsion and was bled and purged. Soon after this, however, he began to improve, and by the middle of November had no edema and but little ascites. He was eating well, had good color and was much improved in every way. His urine contained the slightest possible trace of albumin and a rare hyaline cast. The phenolsulphonephthalein excretion in two hours was 64 per cent., while the systolic blood pressure was 120 and the diastolic 70.

He continued to improve, so that by the middle of December he looked and acted perfectly normal. The urine contained no albumin and no sediment. The salt and urea excretion were found to be normal. He has been symptomatically well since that time, although the urine at times contained a very slight trace of albumin and an occasional cast up to July, 1916. Since then the urine, on repeated examinations, has shown nothing abnormal. He was last seen about April 1, 1917. The systolic blood pressure in January, 1917, was 90 and the diastolic, 55.

Judging from the history and the condition of the kidneys found at operation, this boy probably had an acute exacerbation of a chronic nephritis. He would have almost certainly died in a few weeks or months without an operation. He is now well and has had a normal urine for eight months.

CASE 25.—A girl, aged 5½ years, entered the Children's Hospital, July 13, 1915. She had had tonsillitis two months before. She was admitted to the hospital because of a severe purpura of nine days' duration. She had bloody stools and joint symptoms in addition to a hemorrhagic eruption. She also had endocarditis and myocarditis. The urine began to contain blood and casts, July 26. Transfusion was done, August 3. This relieved the general purpuric condition, but the urine continued to contain from a slight trace to a trace of albumin, a moderate number of red blood corpuscles and many granular casts. The systolic blood pressure, Aug. 9, 1915, was 140; the diastolic, 90. The phenolsulphonephthalein excretion in September was only 33 per cent., and there was considerable interference with the salt and nitrogen excretion. The phenolsulphonephthalein excretion in November was 60 per cent., but there was no improvement in the excretion of salt and nitrogen. She was sent home, Dec. 8, 1915. At this time the systolic pressure was 125 and the diastolic, 78.

She returned to the hospital March 22, 1916, having shown no improvement at home. She was edematous, extremely pale, was vomiting, and the urine contained a large trace of albumin, many granular casts and a little blood. She was in unsatisfactory condition and operation on the kidneys was delayed until it was decided that her heart would bear the strain of the operation. Her systolic blood pressure at that time was 104 and the diastolic, 60. The phenolsulphonephthalein excretion was 44 per cent. The urine showed an almost complete fixation of gravity, between 1.005 and 1.008.

Decapsulation of the right kidney was performed, May 4, 1916, by Dr. Charles S. Mixter. The kidney was large and pale and the capsule was easily stripped off. The left kidney was nothing but an atrophied, soft mass, looking very little like a kidney. Nothing was done to it, as apparently most of this kidney was destroyed. She was very weak for a number of days after the operation and there was at first no important change one way or the other. Her urine about a month after the operation contained a distinct trace of albumin, while the sediment showed many red blood corpuscles and an occasional hyaline and granular cast. From this time, her general condition steadily improved so that when seen May 6, 1917, she looked and acted perfectly well. She was well nourished, color was good and there was no edema. Her urine then showed a large trace of albumin. The sediment contained leukocytes and many hyaline and granular casts, but no blood. The phenolsulphonephthalein excretion in two hours was only 25 per cent. The urine still showed a marked fixation of gravity. The level, however, was much higher, being between 1.017 and 1.020.

This girl was changed by the operation from a helpless, bedridden invalid to a normal looking and feeling child. She would probably have lived but a short time without the operation. She is now, one year after the operation, symptomatically well. She is not, of course, cured, and will sooner or later die of her disease.

CASE 26.—A girl, aged 10 years, had had chickenpox but no other contagious disease. Her tonsils had been removed at 7 years, because of their large size, not because of tonsillitis. Her parents had noticed for a year that she tired easily and had lost color. She had occasional headaches, but otherwise seemed well. Early in March, 1915, her physician, who was visiting another member of the family, noticed that her face was puffy and asked for some of the urine. This he found to contain albumin. I saw her first, Sept, 24, 1915. During this period she had been on a careful diet and had improved in general health. She had no headaches, but was always somewhat edematous. The urine was passed freely and usually contained about 0.25 per cent. of albumin and had a specific gravity of from 1.010 to 1.012. The sediment showed leukocytes and red corpuscles with some hyaline casts and a few fatty casts. The sediment had never contained tubercle bacilli. She was a little pale but did not look or act sick. The systolic blood pressure was 108.

Dr. Edward Reynolds decapsulated the kidneys, Sept. 29, 1915. Both kidneys were large, soft and apparently fatty degenerated and the capsule was not adherent. The right kidney was split to determine if there was any local trouble in the pelvis. The left kidney was not split, but the appearance was the same. She stood the operation well and was out of bed in three weeks. The urine continued to contain from 0.125 to 0.25 per cent. of albumin, but had very little sediment, which showed an occasional cast and red blood cell. Her general condition since the operation has been better than before. She has had no headaches but at times has had some nausea but no edema. She has gained in weight and in height. The urine has continued to contain albumin, occasional casts being found; April 2, 1917, it was pale, acid, of a specific gravity of 1.010, and contained 0.125 per cent. of albumin. The sediment showed may squamous cells and a few leukocytes, some large and small round cells, an occasional red corpuscle and rarely a hyaline cast.

After a year and a half she is better than before the operation and apparently has some years of life ahead of her, whereas it seemed before the operation that she had but a few months to live.

CASE 27.—A boy, aged 9 years, had measles and whooping cough at 5 years. His tonsils and adenoids were removed when he was 7½ years old. He had had a discharge from one ear for some time and had had bad teeth for a long time. A month before he entered the Children's Hospital, his mother noticed that his scrotum was swollen. He was put on a careful diet and improved up to two days before entrance to the hospital, when he became very edematous and began to vomit. His eyesight also began to fail.

He was admitted, June 23, 1916. There was marked general edema; the teeth were bad; ascites was present. The systolic blood pressure was 106, the diastolic, 70. The urine was smoky, acid in reaction, of a specific gravity of 1.018 and contained a large trace of albumin. The sediment showed many red corpuscles and an occasional hyaline cast. Under treatment the patient passed considerable urine and the edema diminished. From that time his condition varied; at times being edematous; sometimes he passed urine rather freely.

The urine always contained a considerable amount of albumin, red corpuscles and hyaline casts; and as there was no permanent improvement, decapsulation of the kidneys was decided on.

Decapsulation of the kidneys was performed, Sept. 15, 1916, by Dr. Charles S. Mixter. The left kidney was found to be twice the normal size, soft, flabby and white. The capsule was incised and stripped back from the kidney. It loosened readily. On the right side, the muscles and fascia over the right loin were found to be bound down with old inflammatory tissue. The peritoneum was greatly thickened, and the lower pole of the kidney was adherent to the inflammatory mass. The inflammation arose probably from within the abdomen as the result of retrocecal appendicitis and had involved the kidney capsule. As it was found impossible to deliver the kidney into the wound, the capsule was incised and stripped back with the kidney in position. The right kidney was of normal size, soft, flabby and white. There was little or no improvement after the operation; the ascites increased rapidly, necessitating frequent tapping; the urine was diminished in amount; the blood pressure went up to 120 during the next month. At this time the phenolsulphonephthalein excretion was less than 10 per cent. in two hours and the urine contained a trace of albumin and hyaline and granular casts.

After leaving the hospital the patient had to be tapped frequently for a number of months, but early in May was able to return to school, having had no ascites for some time. The patient was not again examined, but judging from his mother's description, although he felt much better, yet he was not well. The urine, obtained May 20, 1917, was slightly alkaline, clear, straw-colored, and contained a large amount of albumin. There was no macroscopic sediment on standing over night. The centrifugalized sediment showed epithelial cells, many hyaline, a few fine granular and a rare waxy cast, with an occasional red cell.

In this instance, it seems fair to assume that the boy was somewhat benefited by the operation, although no good effects were seen for some time. He probably would not have been alive and going to school in May, 1917, if the operation had not been done. His condition is, however, bad and he is not likely to live many months.

### COMMENT

It is very hard to understand how decapsulation of the kidneys can be of any benefit in chronic nephritis, either in childhood or in adult life. Nevertheless, it apparently does do good, at any rate in childhood, in a not inconsiderable number of cases. The good which it does cannot be due to the relief of tension and congestion, as in acute nephritis. The facts we know regarding the physiology and pathology of the kidneys, as well as the results of most experiments on animals, show that the improvement cannot be due to the establishment of a new circulation from the outside of the kidney. In lieu of a better explanation, it may be that the improvement is the result of changes in the circulation or functioning of the kidneys, initiated by the handling of the kidneys at the time of the operation.

However that may be, the results of decapsulation of the kidneys in these twenty-three cases are certainly encouraging. All of them were going from bad to worse under medical treatment. Humanly speaking, all the patients would have died in a short time. Apparently as the result of the operation, two patients have been permanently cured, one of them being well and with a normal urine after nine years and another after eight months. Another was well for two years and then died of an acute nephritis in no way connected with the previous illness. Two others were well as long as they were under observation, but the time was too short to consider them cured. Nine others have been so much improved by the operation, or at any rate the improvement began immediately after the operation, that they have been symptomatically well for months or years instead of being chronic invalids, as they were before the operation. These patients have not, of course, been cured, and will certainly die at some time of their disease. Nevertheless, the addition of months or years of apparent health seems to amply justify the operation in these cases.

### CONCLUSIONS

Edebohls' operation is of much value in properly selected cases of nephritis in childhood. It may save life and result in permanent cure in acute nephritis. No child ill with acute nephritis should be allowed to die, therefore, without giving it the advantage of the chance afforded by this operation. It may prolong life for considerable periods in a not inconsiderable number of cases of chronic nephritis, and may possibly, in rare instances, result in cure. It should, therefore, always be considered in all cases of chronic nephritis in childhood which are not responding reasonably well under medical treatment.

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### ABSTRACT OF DISCUSSION

DR. J. S. WALL, Washington, D. C.: These kidney cases resemble cardiac cases, in that the patients leave the hospital and come back in two or three months with renal decompensation. They get better, go away, and come back in a very few months with another renal decompensation. I think the proof of the pudding is always in the eating, notwithstanding what the physiologists and pathologists tell us.

It is a striking thing that the puerile kidney withstands the attack of so many affections. We see this in the way it gets rid of uric acid deposits. It does not succumb to septic nephritis, but gets pyelitis, from which the child usually recovers, but from which an adult might not. This same resistance is only possessed, perhaps, by pregnant women, who can recover from a septic pyelitis.

We have some hope in an operation of this sort, because the kidney is growing; it is developing. I think we should determine some sort of criteria by which we might judge when the Edebohl operation is to be selected and when discarded. In a case I have in mind, the child's urine was full of casts. He was most edematous. He was admitted to the hospital in June with extreme anasarca. The urine contained much albumin. The capsule was removed, the operation only taking twenty minutes. The next few days were very stormy. Since that time he has much improved, and I hope in a future report to be able to add him to Dr. Morse's twenty cases.

DR. JOHN LOVETT MORSE, Boston: I want to emphasize the difference in the indications for decapsulation in acute and chronic nephritis. In the acute cases, the operation is done to relieve congestion temporarily, and if the patient can be tided over a few hours or a day or two he has the same chance which every patient with an acute case has. In chronic nephritis, there seems to be no reason for doing the operation, except that experience has shown that a certain number are benefited, and occasionally one is cured. In most cases, I think, life is prolonged.

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**First Printed American Pharmacopeia.**—The earliest American pharmacopeia to be printed was that prepared for use of the Continental Army by Dr. William Brown of Virginia, who succeeded Rush as physician-general of the Middle Department (1778-1780). It was issued from the military hospital at Lititz, Lancaster County, Pa., and appeared anonymously as a Latin booklet of thirty-two pages in 1778.—Lieut.-Col. C. C. McCulloch, Jr., U. S. Army: The Scientific and Administrative Achievement of the Medical Corps of the United States Army, *Scientific Monthly*.

# OCCURRENCE OF TUBERCLE BACILLI IN BREAST MILK OF TUBERCULOUS WOMEN *

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AND
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Behring announced in 1903 that pulmonary tuberculosis could be induced from intestinal infection and that infants often become tuberculous from the milk fed to them. Since then there have been many investigations of the occurrence of tubercle bacilli in milk. The milk of tuberculous cows is of most importance in such investigations, but the milk of tuberculous women is also worthy of consideration. The demonstration of tubercle bacilli in human milk and the production of tuberculosis in animals with such milk would point out a possible means of direct transmission of the disease from mother to child. Early life is the period when individuals are most susceptible to tuberculosis, and every possible avenue of infection of children should be investigated and safeguarded if possible.

The available statistics regarding the bacteriology of human milk are much less than those of cow's milk, and the literature reveals a lack of concerted conclusions. Cow's milk has been widely investigated, and the many researches of the occurrence and incidence of tubercle bacilli as well as the abattoir and tuberculin statistics have established certain accepted results. Chief of these is that the milk of a tuberculous cow should not be used for food. However, cow's milk is a much greater source of food supply, and specimens and other necessary data are more readily obtained, which perhaps accounts for its wider research.

Holt[1] states that:

> Tubercle bacilli have been demonstrated by Roger and Garnier in the milk of a woman with advanced tuberculosis, but ordinarily they are not present unless the mammary glands are the seat of the disease.

Marfan[2] also mentions the case of Roger and Garnier and the case of Demme, and he states that these are the only two authentic cases of children being infected by the mother's milk. He thinks it is best not to allow a tuberculous mother to nurse her child because the mother's nutrition is lowered and the child receives an insufficient amount of milk, which probably contains toxic substances even if it does not contain tubercle bacilli.

Kurashiga[3] and his co-workers found tubercle bacilli in the breast milk of tuberculous women who had no mammary disease. However, they also found tubercle bacilli in the blood of tuberculous patients in all stages of the disease, and also in the blood of healthy adults in considerable numbers. These findings have not been confirmed by many other observers.

Bandelier and Roepke[4] say:

> The danger of transference of tubercle bacilli to the infant is a real one; according to observations on animals and humans the mammary glands have no special defensive power, and Cornet was able in several rare instances to find tubercle bacilli in the milk of tubercular women who were not suffering with miliary tuberculosis. . . . The danger of infection from the mother's milk is very small compared with the much greater one of infection during the naturally intimate relationship between mother and child, provided the tuberculosis is of the open form.

Deutsch's[5] observations on nursing and nonnursing tuberculous mothers and their infants are of importance. He used healthy mothers as a comparison, and he considered active, inactive and suspicious cases of tuberculosis; the active cases had favorable prognosis. He stated that suckling had on the tuberculous mother only rarely a good effect, usually an unfavorable and sometimes a destructive one. Almost all the infected children had been suckled by tuberculous mothers, while the children who were not suckled, even if there was a hereditary tendency, all remained healthy. Deutsch apparently inclines toward the view that the milk of a tuberculous mother contains some toxic substance, which in some way lowers the resistance of the child.

Butler[6] investigated the opsonic content of breast milk of normal mothers, for tubercle bacilli, with negative results.

Noeggerath[7] investigated the occurrence of tubercle bacilli in the breast milk of twenty-six tuberculous women. He injected guinea-pigs intraperitoneally and subcutaneously with breast milk, and four months later killed the guinea-pigs and examined them for tuberculosis. He produced tuberculosis in guinea-pigs with the milk from four cases, one active case, two latent and one suspect. Noeggerath does not believe that tubercle bacilli are excreted in breast milk in large enough numbers to be a frequent and wide source of danger to the child. However, he thought it best for tuberculous mothers to feed their children artificially.

At Sea View Hospital, Staten Island, N. Y., during the past year and a half, the breast milk of twenty-eight tuberculous women has been examined for tubercle bacilli. Some of these women gave birth to children in this hospital; others entered the hospital after childbirth elsewhere. The specimens of milk were obtained from these women twice each week, from 3 to 5 c.c. being gathered by breast massage, under aseptic precautions, for each examination. All specimens were examined within two hours after they were withdrawn from the breast. A plain smear was first examined for tubercle bacilli, and then the remainder of the specimen was reduced with weak antiformin solution and the resulting sediment examined for tubercle bacilli. The usual Ziehl Neelsen staining technic was used. The antiformin procedure was carried out in the following manner: The milk specimen was mixed with an equal amount of 5 to 10 per cent. antiformin solution, depending on the consistency of the milk, and placed in the incubator for one hour. It was then centrifuged for ten minutes at high speed,

* Read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Holt, L. Emmet: The Diseases of Infancy and Childhood, 1910, 139.

2. Marfan, A. B.: Pathogenic Micro-Organisms in Milk, Le nourisson, 1916, **4**, 34.

3. Kurashiga, T.; Mayema, R., and Yamada, G.: Ausscheidung des Tuberkelbazillen aus der Milch tuberculoser Frauen, Ztschr. f. Tuberk., 1912, **18**, 433.

4. Bandelier and Roepke: Clinical System of Tuberculosis, 1913, p. 338.

5. Deutsch: Tuberculose und Stillen, München. med. Wchnschr., 1910, **57**, 1335.

6. Butler, W. J.: The Opsonic Content of Breast-Milk, Tr. VI, Internat. Cong. Tuberc., **2**, Sec. iv, p. 390.

7. Noeggerath, C. T.: Das Stillverbot bei Tuberkulose und Tuberkulose Verdacht, Prakt. Ergebn. d. Geb. u. Gynec., 1911, **4**, 1.

the supernatant liquid decanted and the sediment washed with distilled water and again centrifuged for ten minutes. The sediment was smeared on slides, fixed with the usual egg albumin fixative, stained and examined. Specimens from each of the last fifteen of our series were injected into guinea-pigs intraperitoneally, and the guinea-pigs were killed six weeks later and examined for tuberculous changes.

The twenty-eight tuberculous women had the following various types of tuberculosis: There were twelve moderately advanced, uncomplicated; one moderately advanced with an orthopedic complication; two moderately advanced complicated by tuberculous laryngitis; nine far advanced, uncomplicated, and four far advanced complicated by tuberculous laryngitis. The ages ranged from 19 to 40. Their tuberculous manifestations varied from those of the chronic indolent fibroid to the rapid fulminating miliary types. One-half (fourteen) seemed to show some improvement during their stay in the hospital, four died inside of a month after delivery, and the remaining ten showed no improvement. Most of the group were multiparas. There was no apparent mammary disease or suspicion of such in any case.

As stated before, specimens from fifteen cases were injected into guinea-pigs, intraperitoneally. All were subsequently negative, no tuberculous changes being found and no effects of any kind from the milk injections.

Altogether there were about 450 microscopic examinations of specimens taken biweekly from the whole series of twenty-eight cases. These were all negative except one, which was positive once, and one other specimen from the same case which was suspicious once. This case was a pulmonary-orthopedic patient with negative sputum, which was ascertained by repeated examinations for over eight months, and she had no symptoms of active pulmonary tuberculosis. She had tuberculous bones in both wrists which were progressing very favorably. This woman insisted on nursing her child and she nursed it regularly for about seven months. The child is now over 1½ years old, has never been sick, and seems to be a very healthy and well developed child. We regret that we did not have an opportunity to inject a specimen of her milk into a guinea-pig, for it is questionable whether or not the acid-fast bacilli found in her milk were tubercle bacilli.

The specimens were taken during all periods of mammary activity both before and after childbirth and from the one who nursed her child. In one case we obtained specimens regularly for eighty-eight days before labor, and in another case for over a year since labor. Colostrum was frequently examined and twice injected into guinea-pigs.

When we first began our microscopic examinations we were a little doubtful as to the efficiency of such examinations, for we supposed that acid-fast bacilli other than tubercle bacilli might be found. However, only one case showed acid-fast bacilli, the pulmonary-orthopedic mentioned; therefore we experienced no difficulty on that point. Our examinations were made within two hours after withdrawal from the breast, which may account for this.

We also made some observations on two guinea-pigs that were fed breast milk from two tuberculous women. The milk from these women, both of whom had normal full term deliveries in the hospital, was fed to the animals three times daily, for one month. As much milk was obtained for each feeding as was possible, the amounts varying from 10 to 40 c.c. The pigs were a little reluctant at the beginning to take the milk, but after the first day or two they both took it very readily. A small amount of lettuce and bread was also fed to them. Our idea in this experiment was to ascertain if the animals became tuberculous, and if they did not, whether they gained weight and throve on these feedings. If these specimens of milk contained toxic substances, as Marfan[2] and Deutsch[5] seem inclined to believe, it was thought that the guinea pigs might show some effects from the daily ingestion of such relatively large amounts. Both guinea-pigs had lost weight at the end of the thirty days of feeding. A short time after we stopped the feeding of the milk, necropsy was performed on the guinea-pigs, and no evidences of tuberculosis were found in either animal.

All of our results were negative with the one exception, which may be questionable. The observations of the others herein referred to, and our experiences indicate that tubercle bacilli are infrequently found in the breast milk of tuberculous women who have no mammary disease. The possibility of infection from such milk is probably slight, but it is very likely best to inderdict nursing in every instance because the other additional factors, such as the danger of infection during the intimate relationship of the mother and the nursing child, the possibility of toxic substance in the milk and the frequent bad effects of nursing on the mother, would seem, collectively, to be sufficient reason to resort to artificial feedings. An exception might be made that a mother with a closed case of tuberculosis should be allowed to nurse her infant, although it is often difficult to distinguish between a closed and open case after pregnancy and labor. The tuberculous woman undergoes a profound strain before and during childbirth, and it frequently takes a long period of observation to ascertain if her disease has been activated.

Sea View Hospital, Staten Island, N. Y.

## Clinical Notes, Suggestions, and New Instruments

### PAINLESS AND BLOODLESS REMOVAL OF CHALAZION WITHOUT LID CLAMP

EDWARD J. BERNSTEIN, M.D., DETROIT

While the application of the lid clamp to the lids, for the removal of chalazion, controls hemorrhage, it is quite painful even though the conjunctiva is quite well cocainized. As soon as the clamp is released, an annoying bleeding occurs and the curettage of the sac makes even the most stoic wince. It occurred to me that it would be a gain if I could make use of the Freer method of anesthesia and blood control used in nasal surgery. I have done this with such success that I give it to the profession:

A cotton tipped probe is dipped into the stock solution of epinephrin, and a few flakes of pure cocain picked up; this is rubbed into the conjunctiva over the mass and a short distance beyond. In two minutes, with the same probe and solution, the area is again rubbed. In another two minutes anesthesia and blanching is complete. After making the cut into the conjunctiva, I have made use of Meierhof's tympanum curet to remove the sac. This curet differs from the ordinary type in that its edges are serrated and thus thoroughly remove the whole sac with the least damage.

# MEDICAL EDUCATION IN THE UNITED STATES

## ANNUAL PRESENTATION OF EDUCATIONAL DATA FOR 1917 BY THE COUNCIL ON MEDICAL EDUCATION

The tabulated statistics herewith presented are for the year ending June 30, 1917, and are based on reports received from the medical colleges or from other reliable sources. We take pleasure in acknowledging here the courtesy and cooperation of the officers of the colleges who have made the compilation of these complete statistics possible.

### STATISTICS OF COLLEGES

Table 1 (pages 534-536) gives the colleges in session during 1916-17; the population of the city; the rating given to the college in the latest classification of the Council on Medical Education; the number of students, men and women, registered during the year; the number of 1917 graduates, men and women; the number of graduates holding collegiate degrees; the number of teachers for each college; the number of weeks of actual work in the college year; the total fees for each year; the executive officer of the college, and the dates of beginning and ending of the next session. The figures in heavy-faced type show the totals by states. Beginning on page 553 are given essential facts concerning all medical colleges, arranged by states.

### HOME STATES OF MEDICAL STUDENTS

Table 2, on pages 538-541, shows from what states the students came who were in attendance at each medical college during the session of 1916-17. The influence of the proximity of the medical school is seen in the fact that states having medical colleges contribute more students in proportion to the population than those which have no colleges. This is shown by the dark zone of figures running diagonally down the page. A comparison of this table with the large tables based on state board examinations,[1] which show the distribution of the alumni of each college, is interesting. The college which has widely distributed alumni usually has a student body from an equally large number of states.

The state furnishing the largest number of students this year was New York, with 2,113. Illinois contributed 1,159 and Pennsylvania, 1,106. The next states, in the order of the number of students contributed, are: Ohio, 628; Massachusetts, 615; Texas, 501, and Michigan, 409. Four states had less than 20 each, these being Arizona, 11; New Mexico, 9; Wyoming, 8, and Nevada, 4. There were 105 students from Hawaii, Porto Rico and the Philippine Islands, and 317 students from foreign countries.

In Table 3, on page 542, the students enrolled in each college are shown by classes. This permits one to see whether the attendance at each college is increasing or decreasing. The total attendance for the first year was 4,107, as compared with 3,582 freshmen last year. The second year attendance was 3,117, as compared with 3,094 last year. The enrolments for the third and fourth years, respectively, were 2,866 and 3,674, as compared with 3,559 and 3,727 last year. The freshman and sophomore class enrolments, therefore, show increases, respectively, of 525 and 23 over the enrolments of the previous year. This indicates that the college enrolments have largely been readjusted under the higher entrance requirements and, as was expected, the enrolment of medical students is again on the increase.

### AGES OF GRADUATES OF 1917

Table 4 gives figures showing the ages of the graduates of 79 medical colleges, from which complete information regarding ages was obtained. These schools are arranged in three groups: those which required for admission (1) a high school education; (2) one year of college work and (3) two or more years of college work in 1913, at the time these graduates matriculated. The chief difference is noted in the number of students in the groups who graduated under the age of 22. There were 35 in Group 1, 1 in Group 2 and none in Group 3. In Group 1 the largest number of graduates (260) were 24 years of age, in Group 2 also the largest number (76) were 24 years of age, while in Group 3 the largest number (214) were 25 years of age. It is noteworthy that the colleges included in Group 1 enrolled a proportionately larger number who were over 35 years of age. In fact, in Group 1 there were 16 graduates over 40 years of age and 2 who were over 50 years. In Groups 2 and 3, there were, respectively, 3 and 4 graduates over 40 years of age and none over 50. A study of these fig-

(Continued on page 537)

TABLE 5.—MEDICAL COLLEGE ATTENDANCE

| Year | Non-sectarian | Homeopathic | Eclectic | Physio-Med. | Nondescript | Total |
|---|---|---|---|---|---|---|
| 1880..... | 9,776 | 1,220 | 830 | ... | ... | 11,826 |
| 1890..... | 13,521 | 1,164 | 719 | ... | ... | 15,404 |
| 1900..... | 22,710 | 1,909 | 522 | ... | ... | 25,171 |
| 1901..... | 23,846 | 1,683 | 664 | 80 | 144 | 26,417 |
| 1902..... | 24,878 | 1,617 | 765 | 91 | 150 | 27,501 |
| 1903..... | 24,930 | 1,498 | 848 | 149 | 190 | 27,615 |
| 1904..... | 23,602 | 1,309 | 1,014 | 123 | 234 | 28,142 |
| 1905..... | 24,119 | 1,104 | 578 | 114 | 232 | 26,147 |
| 1906..... | 23,116 | 1,085 | 644 | 110 | 249 | 25,204 |
| 1907..... | 22,303 | 1,039 | 545 | 97 | 292 | 24,276 |
| 1908..... | 20,936 | 891 | 479 | 90 | 206 | 22,602 |
| 1909..... | 20,554 | 899 | 413 | 52 | 227 | 22,145 |
| 1910..... | 20,136 | 867 | 455 | 49 | 19 | 21,526 |
| 1911..... | 18,414 | 890 | 433 | 49 | ... | 19,786 |
| 1912..... | 17,277 | 827 | 308 | ... | ... | 18,412 |
| 1913..... | 15,919 | 850 | 256 | ... | ... | 17,015 |
| 1914..... | 15,438 | 794 | 270 | ... | ... | 16,502 |
| 1915..... | 13,914 | 736 | 241 | ... | ... | 14,891 |
| 1916..... | 13,121 | 638 | 263 | ... | ... | 14,022 |
| 1917..... | 12,925 | 580 | 250 | ... | ... | 13,764 |

1. THE JOURNAL, State Board Number, April 14, 1917, pages 1102 to 1109 inclusive.

# TABLE 1.—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA

| Marginal Number | NAME AND LOCATION OF COLLEGE | Population of City where College is Located (Census Bureau of 1915) | Classification by Council on Medical Education | No. of Students Registered 1916-17 | | Graduates 1917 | | Grads. with A.B., B.S. or Ph.B. | Number of Teachers | Weeks in College Year | Total Fees (Dollars) | | | | Executive Officer | Session of 1917-18 | | Marginal Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Men | Women | Men | Women | | | | 1st year | 2d year | 3d year | 4th year | | Begins 1917 | Ends 1918 | |
| | **ALABAMA** | | | **43** | ... | **18** | ... | **1** | | | | | | | | | | |
| 1 | University of Alabama School of Medicine, Mobile | 56,536 | A | 43 | ... | 18 | ... | 1 | 41 | 32 | 160 | 155 | 155 | 180 | T. H. Frazer, M.D., Dean | Oct. 4 | June 5 | 1 |
| | **ARKANSAS** | | | **43** | ... | **15** | ... | **1** | | | | | | | | | | |
| 2 | University of Arkansas Medical Department, Little Rock | 55,158 | B | 43 | ... | 15 | ... | 1 | 60 | 34 | 50 | 50 | 50 | 50 | Morgan Smith, M.D., Dean | Sept. 17 | May 29 | 2 |
| | **CALIFORNIA** | | | **477** | **63** | **116** | **25** | **43** | | | | | | | | | | |
| 3 | College of Medical Evangelists, Loma Linda | 125 | C | 47 | 8 | 9 | 4 | 4 | 52 | 36 | 166 | 161 | 136 | 136 | Newton Evans, M.D., President | Sept. 2 | May 30 | 3 |
| 4 | College of Physicians and Surgeons, Los Angeles | 465,367 | B | 123 | 13 | 44 | 5 | ... | 103 | 36 | 220 | 217 | 202 | 227 | Charles W. Bryson, M.D., Dean | Sept. 4 | June 6 | 4 |
| 5 | Oakland College of Medicine and Surgery, Oakland | 190,803 | B | 13 | 3 | 3 | 1 | 1 | 44 | 35 | 185 | 179 | 150 | 175 | Edward N. Ewer, M.D., Registrar | Aug. 20 | May 14 | 5 |
| 6 | College of Physicians and Surgeons of San Francisco | 448,502 | C | 73 | 4 | 7 | 1 | ... | 39 | 36 | 193 | 192 | 193 | 217 | C. O. Southard, M.D., Secretary | Sept. 3 | June 6 | 6 |
| 7 | Hahnemann Medical College of the Pacific, San Francisco.—H. | 448,502 | B | 26 | 6 | 14 | 4 | ... | 27 | 36 | ... | ... | ... | 130 | James W. Ward, M.D., Dean | Aug. 14 | May 15 | 7 |
| 8 | Leland Stanford Junior Univ. School of Medicine, San Francisco | 448,502 | A | 80 | 20 | 17 | 6 | 21 | 97 | 34 | 160 | 155 | 150 | 150 | William Ophüls, M.D., Dean | Oct. 1 | June 13 | 8 |
| 9 | University of California Medical School, San Francisco | 448,502 | A | 115 | 14 | 22 | 4 | 17 | 139 | 33 | 195 | 155 | 160 | 150 | Herbert C. Moffitt, M.D., Dean | Aug. 20 | Apr. 27 | 9 |
| | **COLORADO** | | | **81** | **4** | **20** | **1** | **16** | | | | | | | | | | |
| 10 | University of Colorado School of Medicine, Denver[1] | 253,161 | A | 81 | 4 | 20 | 1 | 16 | 89 | 35 | 85 | 85 | 75 | 75 | Charles N. Meader, M.D., Dean | Sept. 10 | June 5 | 10 |
| | **CONNECTICUT** | | | **74** | **3** | **10** | ... | **9** | | | | | | | | | | |
| 11 | Yale University School of Medicine, New Haven | 147,095 | A | 74 | 3 | 10 | ... | 9 | 75 | 35 | 195 | 165 | 150 | 163 | George Blumer, M.D., Dean | Sept. 27 | June 19 | 11 |
| | **DISTRICT OF COLUMBIA** | | | **276** | **9** | **66** | **1** | **15** | | | | | | | | | | |
| 12 | Georgetown University School of Medicine, Washington | 358,679 | A | 60 | ... | 13 | ... | 7 | 91 | 34 | 165 | 150 | 150 | 150 | George M. Kober, M.D., Dean | Sept. 26 | June 12 | 12 |
| 13 | George Washington University Medical School, Washington | 358,679 | A | 108 | 6 | 40 | 1 | ... | 94 | 33 | 175 | 175 | 175 | 175 | W. C. Borden, M.D., Dean | Sept. 26 | June 5 | 13 |
| 14 | Howard University School of Medicine, Washington | 358,679 | A | 108 | 3 | 13 | ... | 8 | 39 | 32 | 140 | 130 | 130 | 137 | Edward A. Balloch, M.D., Dean | Oct. 1 | June 5 | 14 |
| | **GEORGIA** | | | **204** | ... | **74** | ... | **6** | | | | | | | | | | |
| 15 | Emory University School of Medicine, Atlanta[2] | 184,873 | A | 149 | ... | 63 | ... | 5 | 122 | 32 | 172 | 160 | 155 | 180 | W. S. Elkin, M.D., Dean | Sept. 24 | May 28 | 15 |
| 16 | University of Georgia Medical Department, Augusta[1] | 49,848 | A | 55 | ... | 11 | ... | 1 | 49 | 34 | 55 | 50 | 55 | 60 | William H. Doughty, Jr. | Sept. 12 | May 29 | 16 |
| | **ILLINOIS** | | | **1802** | **115** | **487** | **34** | **158** | | | | | | | | | | |
| 17 | Chicago College of Medicine and Surgery, Chicago | 2,447,045 | B | 377 | 38 | 171 | 11 | ... | 172 | 32 | 160 | 155 | 155 | 155 | George E. Wyneken, M.D., Secretary | Sept. 25 | May 28 | 17 |
| 18 | Chicago Hospital College of Medicine, Chicago[3] | 2,447,045 | C | 53 | ... | 7 | ... | ... | ... | ... | 137 | 135 | 115 | 145 | ..... | ..... | ..... | 18 |
| 19 | Hahnemann Medical College and Hospital of Chicago.—H. | 2,447,045 | B | 67 | 9 | 25 | 5 | 3 | 83 | 34 | 176 | 162 | 176 | 192 | Joseph P. Cobb, M.D., Dean | Sept. 24 | June 6 | 19 |
| 20 | Jenner Medical College, Chicago | 2,447,045 | C | 113 | 5 | 13 | 1 | ... | 125 | 36 | 140 | 135 | 135 | 175 | John D. MacKellar, M.D., Dean | Sept. 19 | June 22 | 20 |
| 21 | Loyola University School of Medicine, Chicago | 2,447,045 | B | 220 | 8 | 79 | 4 | 5 | 111 | 33 | 155 | 150 | 150 | 175 | Alfred de Roulet, M.D., Dean | Sept. 25 | June 1 | 21 |
| 22 | Northwestern University Medical School, Chicago | 2,447,045 | A | 247 | ... | 42 | ... | 26 | 148 | 33 | 190 | 195 | 190 | 206 | Arthur I. Kendall, M.D., Dean | Oct. 2 | June 8 | 22 |
| 23 | Rush Medical College (University of Chicago) | 2,447,045 | A | 523 | 44 | 113 | 11 | 115 | 274 | 34 | 185 | 180 | 180 | 195 | John M. Dodson, M.D., Dean | Oct. 1 | June 15 | 23 |
| 24 | University of Illinois College of Medicine, Chicago | 2,447,045 | A | 202 | 11 | 47 | 2 | 9 | 128 | 34 | 155 | 160 | 150 | 165 | A. C. Eycleshymer, M.D., Dean | Oct. 1 | June 12 | 24 |
| | **INDIANA** | | | **169** | **6** | **37** | ... | **29** | | | | | | | | | | |
| 25 | Indiana University School of Medicine, Indianapolis | 265,578 | A | 169 | 6 | 37 | ... | 29 | 161 | 35 | 100 | 100 | 130 | 130 | Charles P. Emerson, M.D., Dean | Sept. 17 | June 12 | 25 |
| | **IOWA** | | | **165** | **4** | **21** | ... | **8** | | | | | | | | | | |
| 26 | State University of Iowa College of Medicine, Iowa City[1] | 10,987 | A | 159 | 3 | 20 | ... | 8 | 51 | 35 | 95 | 85 | 85 | 95 | Lee Wallace Dean, M.D., Dean | Sept. 17 | June 7 | 26 |
| 27 | State University of Iowa College of Homeo. Med., Iowa City.—H.[1] | 10,987 | A | 6 | 1 | 1 | ... | 0 | 26 | 35 | 95 | 85 | 85 | 95 | George Royal, M.D., Dean | Sept. 17 | June 7 | 27 |
| | **KANSAS** | | | **110** | **8** | **19** | ... | **15** | | | | | | | | | | |
| 28 | University of Kansas School of Medicine, Rosedale[1] | 392,693 | A | 110 | 8 | 19 | ... | 15 | 57 | 35 | 60 | 60 | 100 | 100 | M. T. Sudler, M.D., Associate Dean | Sept. 20 | June 12 | 28 |
| | **KENTUCKY** | | | **118** | ... | **65** | ... | **4** | | | | | | | | | | |
| 29 | University of Louisville Medical Department, Louisville | 237,012 | A | 118 | ... | 65 | ... | 4 | 96 | 33 | 175 | 176 | 179 | 183 | Henry Enos Tuley, M.D., Dean | Sept. 25 | June 6 | 29 |
| | **LOUISIANA** | | | **259** | **17** | **51** | **1** | **18** | | | | | | | | | | |
| 30 | Tulane University of Louisiana School of Medicine, New Orleans | 366,484 | A | 250 | 17 | 51 | 1 | 18 | 116 | 33 | 190 | 190 | 185 | 215 | Isadore Dyer, M.D., Dean | Sept. 26 | June 5 | 30 |
| | **MAINE** | | | **54** | ... | **10** | ... | **4** | | | | | | | | | | |
| 31 | Bowdoin Medical School, Brunswick-Portland | 63,014 | A | 54 | ... | 10 | ... | 4 | 66 | 33 | 120 | 120 | 110 | 110 | Addison S. Thayer, M.D., Dean | Oct. 11 | June 20 | 31 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **MARYLAND** | | | **615** | **42** | **165** | **9** | **74** | | | | | | | | | | | |
| 32 | Johns Hopkins University Medical Department, Baltimore | 584,605 | A | 317 | 42 | 83 | 9 | 63 | 177 | 33 | 257 | 257 | 257 | 257 | J. Whitridge Williams, M.D., Dean | Oct. 2 | June 11 | 32 |
| 33 | Univ. of Maryland School of Med. & Coll. of P. & S., Baltimore | 584,605 | A | 298 | ... | 82 | ... | 11 | 188 | 32 | 170 | 170 | 170 | 180 | J. M. H. Rowland, M.D., Dean | Oct. 1 | June 3 | 33 |
| | **MASSACHUSETTS** | | | **803** | **46** | **165** | **13** | **192** | | | | | | | | | | | |
| 34 | Boston University School of Medicine, Boston.—H. | 745,139 | A | 51 | 11 | 21 | 3 | 3 | 69 | 32 | 170 | 157 | 157 | 180 | John P. Sutherland, M.D., Dean | Oct. 4 | June 5 | 34 |
| 35 | College of Physicians and Surgeons, Boston[4] | 745,139 | C | 49 | 4 | 10 | 1 | ... | ... | ... | ... | ... | ... | ... | | | | 35 |
| 36 | Medical School of Harvard University, Boston | 745,139 | A | 357 | ... | 67 | ... | 65 | 247 | 36 | 230 | 225 | 225 | 225 | Edward H. Bradford, M.D., Dean | Sept. 24 | June 20 | 36 |
| 37 | Tufts College Medical School, Boston | 745,139 | A | 352 | 31 | 67 | 9 | 124 | 4 | 36 | 160 | 162 | 155 | 155 | Charles F. Painter, M.D., Dean | Sept. 20 | June 18 | 37 |
| | **MICHIGAN** | | | **511** | **20** | **130** | **4** | **59** | | | | | | | | | | | |
| 38 | University of Michigan Medical School, Ann Arbor[1] | 14,984 | A | 302 | 20 | 58 | 4 | 50 | 91 | 35 | 112 | 102 | 102 | 112 | Victor C. Vaughan, M.D., Dean | Oct. 2 | June 27 | 38 |
| 39 | University of Michigan Homeo. Medical School, Ann Arbor.—H.[1] | 14,984 | A | 48 | 0 | 8 | 0 | 4 | 20 | 35 | 112 | 102 | 102 | 112 | W. B. Hinsdale, M.D., Dean | Oct. 2 | June 27 | 39 |
| 40 | Detroit College of Medicine and Surgery, Detroit | 554,717 | A | 161 | ... | 64 | ... | 2 | 170 | 33 | 165 | 155 | 150 | 150 | W. H. MacCraken, M.D., Secretary | Sept. 24 | May 31 | 40 |
| | **MINNESOTA** | | | **256** | **9** | **17** | ... | **13** | | | | | | | | | | | |
| 41 | University of Minnesota Medical School, Minneapolis | 353,460 | A | 256 | 9 | 17 | ... | 13 | 151 | 33 | 150 | 150 | 150 | 150 | Elias P. Lyon, M.D., Dean | Oct. 10 | June 20 | 41 |
| | **MISSISSIPPI** | | | **60** | ... | ... | ... | ... | | | | | | | | | | | |
| 42 | University of Mississippi School of Medicine, Oxford* | 2,014 | A | 60 | ... | ... | ... | ... | 18 | 34 | 122 | 122 | ... | ... | W. S. Leathers, M.D., Dean | Sept. 19 | June 4 | 42 |
| | **MISSOURI** | | | **692** | **27** | **144** | **9** | **37** | | | | | | | | | | | |
| 43 | University of Missouri School of Medicine, Columbia* | 11,371 | A | 80 | 5 | ... | ... | ... | 25 | 34 | 73 | 45 | ... | ... | Guy L. Noyes, M.D., Dean | Sept. 17 | June 5 | 43 |
| 44 | Eclectic Medical University, Kansas City.—E. | 386,733 | C | 27 | 4 | 9 | 2 | ... | 34 | 30 | 150 | 150 | 150 | 150 | Samuel McCubbin, M.D., Dean | Sept. 10 | May 3 | 44 |
| 45 | Kansas City College of Medicine and Surgery, Kansas City.—E.[5] | 386,733 | [5] | 102 | 12 | 16 | 5 | ... | ... | ... | 150 | 150 | 150 | 150 | | | | 45 |
| 46 | National University of Arts and Sciences Med. Dept., St. Louis[6] | 745,988 | C | 61 | 3 | 37 | 1 | ... | 35 | 33 | ... | ... | ... | 160 | E. L. Cooley, M.D., Secretary | June 1 | Feb. 5 | 46 |
| 47 | St. Louis College of Physicians and Surgeons, St. Louis[7] | 745,988 | C | 43 | 3 | 10 | 1 | ... | 49 | 32 | 140 | 140 | 140 | 165 | E. L. Marks, M.D., Secretary | Oct. 1 | June 3 | 47 |
| 48 | St. Louis University School of Medicine, St. Louis | 745,988 | A | 254 | ... | 41 | ... | 12 | 120 | 32 | 155 | 155 | 155 | 155 | Hanau W. Loeb, M.D., Dean | Oct. 1 | June 1 | 48 |
| 49 | Washington University Medical School, St. Louis | 745,988 | A | 125 | ... | 31 | ... | 25 | 108 | 34 | 155 | 150 | 150 | 155 | P. A. Shaffer, M.D., Dean | Sept. 27 | June 13 | 49 |
| | **NEBRASKA** | | | **261** | **7** | **61** | **2** | **20** | | | | | | | | | | | |
| 50 | Lincoln Medical College, Lincoln.—E. | 46,028 | C | 17 | ... | 4 | ... | ... | ... | 34 | ... | ... | ... | ... | F. L. Wilmeth, M.D., Dean | Sept. 15 | June 1 | 50 |
| 51 | John A. Creighton Medical College, Omaha | 135,455 | A | 107 | 1 | 42 | 1 | 3 | 54 | 33 | 157 | 147 | 147 | 152 | James R. Clemens, M.D., Dean | Sept. 21 | June 1 | 51 |
| 52 | University of Nebraska College of Medicine, Omaha | 135,455 | A | 137 | 6 | 15 | 1 | 17 | 66 | 36 | 135 | 130 | 120 | 150 | Irving S. Cutter, M.D., Dean | Sept. 13 | June 12 | 52 |
| | **NEW HAMPSHIRE** | | | **40** | ... | ... | ... | ... | | | | | | | | | | | |
| 53 | Dartmouth Medical School, Hanover* | 1,340 | A | 40 | ... | ... | ... | ... | 12 | 36 | 172 | 173 | ... | ... | John M. Gile, M.D., Dean | Sept. 20 | June 19 | 53 |
| | **NEW YORK** | | | **2223** | **92** | **462** | **23** | **133** | | | | | | | | | | | |
| 54 | Albany Medical College, Albany | 103,580 | A | 110 | ... | 42 | ... | 3 | 68 | 34 | 195 | 175 | 170 | 165 | Thomas Ordway, M.D., Dean | Sept. 24 | June 7 | 54 |
| 55 | University of Buffalo, Department of Medicine, Buffalo | 461,335 | A | 179 | 17 | 54 | 6 | 2 | 112 | 33 | 200 | 200 | 175 | 175 | Thomas H. McKee, M.D., Dean | Sept. 24 | June 7 | 55 |
| 56 | Columbia University, College of Phys. and Surgs., New York City | 5,468,190 | A | 401 | ... | 90 | ... | 72 | 261 | 33 | 265 | 251 | 250 | 275 | Samuel W. Lambert, M.D., Dean | Sept. 26 | June 5 | 56 |
| 57 | Cornell University Medical College, New York City | 5,468,190 | A | 136 | 29 | 24 | 3 | 27 | 128 | 34 | 190 | 185 | 185 | 200 | William M. Polk, M.D., Dean | Oct. 1 | June 13 | 57 |
| 58 | Fordham University School of Medicine, New York City | 5,468,190 | A | 297 | ... | 49 | ... | 2 | 111 | 34 | 225 | 216 | 212 | 210 | William P. Healy, M.D., Dean | Sept. 27 | June 10 | 58 |
| 59 | Long Island College Hospital, Brooklyn | 1,881,065 | A | 295 | ... | 70 | ... | ... | 118 | 33 | 255 | 250 | 250 | 275 | Otto V. Huffman, M.D., Dean | Sept. 24 | May 31 | 59 |
| 60 | New York Homeopathic Med. College and Flower Hospital.—H. | 5,468,190 | B | 170 | ... | 42 | ... | ... | 81 | 31 | 200 | 200 | 200 | 200 | Royal S. Copeland, M.D., Dean | Sept. 25 | May 22 | 60 |
| 61 | New York Medical College and Hospital for Women.—H. | 5,468,190 | C | .... | 38 | ... | 12 | ... | 67 | 34 | 180 | 175 | 160 | 180 | Cornelia D. Brandt, M.D., Dean | Sept. 17 | June 4 | 61 |
| 62 | University and Bellevue Hospital Medical College, New York City | 5,468,190 | A | 429 | ... | 64 | ... | 5 | 142 | 34 | 205 | 200 | 200 | 225 | Samuel A. Brown, M.D., Dean | Sept. 26 | June 12 | 62 |
| 63 | Syracuse University College of Medicine, Syracuse | 152,534 | A | 116 | 8 | 27 | 2 | 22 | 95 | 35 | 200 | 200 | 200 | 210 | John L. Heffron, M.D., Dean | Sept. 18 | June 12 | 63 |
| | **NORTH CAROLINA** | | | **125** | ... | **17** | ... | ... | | | | | | | | | | | |
| 64 | University of North Carolina School of Medicine, Chapel Hill* | 1,449 | A | 64 | ... | ... | ... | ... | 24 | 35 | 125 | 122 | ... | ... | Isaac Hall Manning, M.D., Dean | Sept. 11 | June 5 | 64 |
| 65 | North Carolina Medical College, Charlotte[8] | 38,887 | B | 21 | ... | 17 | ... | ... | ... | ... | ... | ... | ... | ... | | | | 65 |
| 66 | Leonard Medical School, Raleigh* | 19,833 | B | 8 | ... | ... | ... | ... | 8 | 32 | 115 | 115 | ... | ... | George H. Stoddard, Dean | Sept. 26 | May 9 | 66 |
| 67 | Wake Forest College School of Medicine, Wake Forest* | 1,443 | A | 32 | ... | ... | ... | ... | 11 | 35 | 115 | 115 | ... | ... | E. B. Earnshaw, Secretary | Sept. 4 | May 24 | 67 |
| | **NORTH DAKOTA** | | | **32** | **1** | ... | ... | ... | | | | | | | | | | | |
| 68 | Univ. of North Dakota School of Med., University (Grand Forks)* | 14,827 | A | 32 | 1 | ... | ... | ... | 16 | 34 | 50 | 50 | ... | ... | Harley E. French, M.D., Dean | Oct. 8 | June 26 | 68 |
| | **OHIO** | | | **510** | **24** | **144** | **4** | **46** | | | | | | | | | | | |
| 69 | Eclectic Medical College, Cincinnati.—E. | 406,706 | B | 92 | 5 | 29 | ... | 2 | 34 | 32 | 125 | 120 | 120 | 130 | John K. Scudder, M.D., Secretary | Sept. 14 | May 14 | 69 |
| 70 | University of Cincinnati College of Medicine | 406,706 | A | 85 | 9 | 12 | 2 | 8 | 156 | 34 | 150 | 150 | 150 | 170 | Christian R. Holmes, M.D., Dean | Oct. 2 | June 15 | 70 |
| 71 | Western Reserve University School of Medicine, Cleveland | 656,975 | A | 165 | ... | 32 | ... | 32 | 107 | 34 | 175 | 160 | 154 | 155 | C. A. Hammann, M.D., Dean | Sept. 27 | June 13 | 71 |
| 72 | Ohio State University College of Medicine, Columbus | 209,722 | A | 133 | 9 | 63 | 2 | 4 | 91 | 36 | 152 | 152 | 152 | 152 | E. F. McCampbell, M.D., Dean | Sept. 18 | June 18 | 72 |
| 73 | Ohio State University College of Homeo. Medicine, Columbus.—H. | 209,722 | B | 35 | 1 | 8 | ... | ... | 26 | 36 | 150 | 150 | 150 | 150 | Claude A. Burrett, M.D., Dean | Sept. 18 | June 18 | 73 |
| | **OKLAHOMA** | | | **81** | **4** | **24** | ... | **2** | | | | | | | | | | | |
| 74 | University of Oklahoma School of Med., Norman-Oklahoma City | 88,158 | B | 81 | 4 | 24 | ... | 2 | 66 | 34 | 43 | 23 | 25 | 25 | Leroy Long, M.D., Dean | Sept. 18 | June 4 | 74 |
| | **OREGON** | | | **69** | **3** | **11** | **1** | **4** | | | | | | | | | | | |
| 75 | University of Oregon Medical School, Portland | 272,833 | A | 69 | 3 | 11 | 1 | 4 | 78 | 32 | 155 | 150 | 150 | 150 | K. A. J. Mackenzie, M.D., Dean | Oct. 1 | June 1 | 75 |

H.—Homeopathic; E.—Eclectic.

* Gives only the first two years of the medical course.

## TABLE 1.—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA—(Concluded)

| Marginal Number | NAME AND LOCATION OF COLLEGE | Population of City where College is Located (Census Bureau Estimate of 1915) | Classification by Council on Medical Education | No. of Students Registered 1916-17 | | Graduates 1917 | | Grads. with A.B., B.S. or Ph.B. | Number of Teachers | Weeks in College Year | Total Fees (Dollars) | | | | Executive Officer | Session of 1917-18 | | Marginal Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Men | Women | Men | Women | | | | 1st year | 2d year | 3d year | 4th year | | Begins 1917 | Ends 1918 | |
| | **PENNSYLVANIA** | | | **1411** | **68** | **381** | **20** | **112** | | | | | | | | | | |
| 76 | Hahnemann Medical College and Hospital of Philadelphia.—H. | 1,683,664 | A | 111 | ... | 37 | ... | 9 | 86 | 33 | 185 | 185 | 185 | 200 | Wm. A. Pearson, M.D., Dean | Oct. 1 | June 6 | 76 |
| 77 | Jefferson Medical College of Philadelphia | 1,683,664 | A | 540 | ... | 140 | ... | 29 | 157 | 33 | 215 | 210 | 210 | 210 | Ross V. Patterson, M.D., Dean | Sept. 24 | June 1 | 77 |
| 78 | Medico-Chirurgical College of Philadelphia[3] | 1,683,664 | A | 184 | ... | 86 | ... | 5 | 67 | ... | ... | ... | ... | ... | | | | 78 |
| 79 | Temple University Department of Medicine, Philadelphia | 1,683,664 | B | 79 | 4 | 27 | 1 | ... | 91 | 35 | 175 | 170 | 160 | 161 | Frank C. Hammond, M.D., Dean | Sept. 24 | June 15 | 79 |
| 80 | University of Pennsylvania School of Medicine, Philadelphia | 1,683,664 | A | 390 | 11 | 72 | 1 | 50 | 190 | 35 | 233 | 210 | 210 | 214 | William Pepper, M.D., Dean | Sept. 28 | June 19 | 80 |
| 81 | Woman's Medical College of Pennsylvania, Philadelphia | 1,683,664 | A | .... | 43 | ... | 17 | 4 | 61 | 34 | 192 | 176 | 183 | 189 | Martha Tracy, M.D., Acting Dean | Sept. 19 | June 5 | 81 |
| 82 | University of Pittsburgh School of Medicine, Pittsburgh | 571,984 | A | 107 | 10 | 19 | 1 | 15 | 108 | 34 | 265 | 250 | 250 | 255 | Thomas S. Arbuthnot, M.D., Dean | Oct. 1 | June 12 | 82 |
| | **SOUTH CAROLINA** | | | **59** | ... | **24** | ... | **8** | | | | | | | | | | |
| 83 | Medical College of the State of South Carolina, Charleston | 60,427 | A | 59 | ... | 24 | ... | 8 | 59 | 33 | 150 | 150 | 145 | 145 | Robert Wilson, Jr., M.D., Dean | Sept. 28 | June 6 | 83 |
| | **SOUTH DAKOTA** | | | **16** | **1** | ... | ... | ... | | | | | | | | | | |
| 84 | University of South Dakota College of Medicine, Vermilion* | 2,187 | A | 16 | 1 | ... | ... | ... | 10 | 35 | 60 | 60 | ... | ... | Christian P. Lommen, B.S., Dean | Sept. 20 | June 12 | 84 |
| | **TENNESSEE** | | | **546** | **6** | **236** | **3** | **31** | | | | | | | | | | |
| 85 | Lincoln Memorial University Medical Department, Knoxville[10] | 38,300 | B | 5 | ... | 4 | ... | ... | ... | ... | ... | ... | ... | ... | | | | 85 |
| 86 | University of Tennessee College of Medicine, Memphis[4] | 146,113 | A | 117 | 5 | 56 | 2 | 3 | 105 | 34 | 107 | 102 | 102 | 127 | L. Junius Desha, Ph.D., Dean | Sept. 22 | June 5 | 86 |
| 87 | University of West Tennessee College of Med. and Surg., Memphis | 146,113 | C | 20 | ... | 4 | ... | ... | 24 | 31 | 60 | 60 | 60 | 70 | M. V. Lynk, M.D., Dean | Sept. 17 | May 7 | 87 |
| 88 | Meharry Medical College, Nashville | 115,978 | B | 252 | 3 | 97 | 1 | 20 | 25 | 30 | 70 | 70 | 70 | 80 | George W. Hubbard, M.D., President | Sept. 25 | May 9 | 88 |
| 89 | Vanderbilt University Medical Department, Nashville | 115,978 | A | 152 | ... | 75 | ... | 8 | ... | 33 | 125 | 125 | 125 | 175 | Lucius E. Burch, M.D., Dean | Oct. 1 | June 12 | 89 |
| | **TEXAS** | | | **337** | **18** | **75** | **3** | **13** | | | | | | | | | | |
| 90 | Baylor University College of Medicine, Dallas | 118,482 | A | 44 | 1 | 11 | ... | ... | 54 | 32 | 120 | 115 | 115 | 125 | Edward H. Cary, M.D., Dean | Oct. 1 | May 31 | 90 |
| 91 | Fort Worth School of Medicine, Fort Worth | 99,528 | B | 51 | 4 | 16 | 1 | ... | 68 | 23 | 115 | 125 | 115 | 110 | Samuel A. Woodward, M.D., Dean | Oct. 1 | June 8 | 91 |
| 92 | University of Texas Department of Medicine, Galveston | 41,076 | A | 242 | 13 | 48 | 2 | 13 | 41 | 32 | 78 | 47 | 30 | 17 | William S. Carter, M.D., Dean | Oct. 1 | May 31 | 92 |
| | **UTAH** | | | **22** | ... | ... | ... | ... | | | | | | | | | | |
| 93 | University of Utah School of Medicine, Salt Lake City* [4] | 113,567 | A | 22 | ... | ... | ... | ... | 23 | 34 | 100 | 100 | ... | ... | Perry G. Snow, M.D., Dean | Sept. 13 | June 7 | 93 |
| | **VERMONT** | | | **82** | ... | **18** | ... | **3** | | | | | | | | | | |
| 94 | University of Vermont College of Medicine, Burlington | 21,247 | A | 82 | ... | 18 | ... | 3 | 37 | 36 | 145 | 145 | 145 | 170 | Henry C. Tinkham, M.D., Dean | Sept. 26 | June 26 | 94 |
| | **VIRGINIA** | | | **314** | ... | **119** | ... | **18** | | | | | | | | | | |
| 95 | Medical College of Virginia, Richmond | 154,674 | A | 206 | ... | 96 | ... | 12 | 132 | 34 | 170 | 170 | 170 | 200 | Stuart McGuire, M.D., Dean | Sept. 18 | June 4 | 95 |
| 96 | University of Virginia Department of Medicine, Charlottesville | 6,765 | A | 108 | ... | 23 | ... | 6 | 25 | 36 | 150 | 140 | 140 | 14[illegible] | Theodore Hough, M.D., Dean | Sept. 13 | June 12 | 96 |
| | **WEST VIRGINIA** | | | **33** | **1** | ... | ... | ... | | | | | | | | | | |
| 97 | West Virginia University School of Medicine, Morgantown* | 12,239 | A | 33 | 1 | ... | ... | ... | 15 | 35 | 35 | 20 | ... | ... | John N. Simpson, M.D., Dean | Sept. 17 | June 12 | 97 |
| | **WISCONSIN** | | | **181** | **8** | **13** | ... | **10** | | | | | | | | | | |
| 98 | University of Wisconsin Medical School, Madison* [4] | 30,084 | A | 124 | 8 | ... | ... | ... | 32 | 36 | 70 | 70 | ... | ... | Charles R. Bardeen, M.D., Dean | Sept. 24 | June 26 | 98 |
| 99 | Marquette University School of Medicine, Milwaukee | 428,062 | A | 57 | ... | 13 | ... | 10 | 101 | 36 | 175 | 170 | 170 | 195 | J. Van de Erve, M.D., Associate Dean | Sept. 13 | June 13 | 99 |
| | **CANADA**[11] | | | **1597** | **59** | **311** | **4** | **36** | | | | | | | | | | |
| 100 | University of Alberta Faculty of Medicine, Edmonton, Alta.† | 60,000 | — | 29 | 4 | ... | ... | ... | 15 | 30 | 87 | 87 | ... | ... | Cecil E. Race, A.B., Registrar | Oct. 1 | May 16 | 100 |
| 101 | Dalhousie University Faculty of Medicine, Halifax, N. S. | 46,619 | B | 63 | 8 | 14 | ... | 1 | 30 | 32 | 100 | 110 | 110 | 110 | D. Fraser Harris, M.D., Secretary | Sept. 25 | May 30 | 101 |
| 102 | Queen's University Faculty of Medicine, Kingston, Ont. | 18,874 | C | 277 | ... | 56 | ... | ... | 38 | 32 | 115 | 115 | 115 | 115 | J. C. Connell, M.D., Dean | Sept. 26 | May 29 | 102 |
| 103 | University of Toronto Faculty of Medicine, Toronto, Ont. | 376,538 | A | 431 | 39 | 96 | 4 | 15 | 201 | 33 | 150 | 150 | 150 | 150 | C. K. Clarke, M.D., Dean | Sept. 25 | June 1 | 103 |
| 104 | Western University Faculty of Medicine, London, Ont. | 46,300 | B | 71 | ... | 14 | ... | 2 | 57 | 32 | 115 | 115 | 115 | 140 | H. A. McCallum, M.D., Dean | Oct. 1 | May 31 | 104 |
| 105 | McGill University Faculty of Medicine, Montreal, Que. | 473,712 | A | 335 | ... | 63 | ... | 10 | 131 | 31 | 174 | 181 | 174 | 204 | John W. Scane, M.D., Registrar | Oct. 3 | May 24 | 105 |
| 106 | Montreal School of Medicine and Surgery, Montreal, Que. | 473,712 | B | 102 | ... | 29 | ... | ... | 75 | 35 | 118 | 126 | 126 | 138 | E. P. Lachapelle, M.D., Dean | Oct. 3 | June 29 | 106 |
| 107 | Laval University, Faculty of Medicine, Quebec, Que. | 78,190 | B | 87 | ... | 7 | ... | 6 | 29 | 34 | 75 | 75 | 75 | 75 | Edwin Turcot, M.D., Dean | Sept. 18 | June 1 | 107 |
| 108 | University of Manitoba, Manitoba Medical College, Winnipeg | 200,000 | B | 112 | 8 | 32 | ... | 2 | 58 | 30 | 155 | 155 | 155 | 155 | Gordon Bell, M.D., Acting Dean | Sept. 25 | May 11 | 108 |

H.—Homeopathic; E.—Eclectic.

* Gives only the first two years of the medical course.

† Gives the first three years of the five-year medical course.

1. Fees given are for residents of the state. For nonresidents amounts should be added for each year in the several states as follows: Colorado, $25; Georgia, $100; Iowa, $15; Kansas, $20 (for the first two years only); Michigan, $20 (and $25 extra the first year for matriculation); Tennessee, $50; Utah, $25, and Wisconsin, $124.
2. Name recently changed; formerly the Atlanta Medical College.
3. Figures are accurate. Numbers of women students and graduates not obtained.
4. Figures are from a reliable source; partly verified by official reports.
5. This college is an offshoot of the Eclectic Medical University, an institution rated in Class C. It is reported as not recognized by the Missouri State Board of Health.
6. Has declared its intention to discontinue in 1918, after the one remaining class has been graduated.
7. This college merged with the National University of Arts and Sciences in 1915 but in 1916 withdrew and resumed its career as a separate college.
8. Merged in 1914 with the Medical College of Virginia but retained a nominal existence until the three remaining classes had graduated.
9. Merged in 1916 with the University of Pennsylvania and became its Graduate School of Medicine. Continued to teach part of its students, however, during the session of 1916-17.
10. Merged in 1916 with the University of Tennessee College of Medicine but retained a nominal existence until the three remaining classes had graduated.
11. In Canada the entrance requirement to all medical schools is a secondary school education. The Canadian colleges are on a par, however, with medical colleges in the United States which require *one year* of premedical college work, since the first of the Canadian five-year medical course is devoted largely to courses in physics, chemistry and biology. In the United States these courses are required to have been completed in one or two years of *premedical* college work. On a similar basis it could be said that the medical schools of the United States are giving a five-year, or a six-year medical course.

*(Continued from page 533)*

ures shows that, for many medical students, preliminary education has nothing to do with the advanced age of graduation. The chief reason why the average age at graduation is so high is the late time in life at which many students decide to take up the study of medicine.

### NUMBER OF MEDICAL STUDENTS

The total number of medical students (see Table 5) in the United States for the year ending June 30, 1917, excluding premedical, special and postgraduate students, was 13,764, a decrease of 258 below last year. It is noteworthy, however (see Table 13, page 544), that in the high grade (Class A) medical colleges the total enrolment of students shows an increase. Of the total number of students, 12,925 (93.9 per cent.) were in attendance at the nonsectarian (regular) colleges, 580 (4.2 per cent.) at the homeopathic and 259 (1.9 per cent.) at the eclectic colleges. As indicated by the larger enrolments in the freshman and sophomore classes, the enrolment of medical students has about reached its lowest ebb under the higher entrance requirements.

### NUMBER OF MEDICAL GRADUATES

The total number of graduates for the year ending June 30, 1917, was 3,379, a decrease of 139 below

TABLE 6.—MEDICAL COLLEGE GRADUATES

| Year | Nonsectarian | Homeopathic | Eclectic | Physio-Med. | Nondescript | Total |
|---|---|---|---|---|---|---|
| 1880..... | 2,673 | 380 | 188 | .. | .. | 3,241 |
| 1890..... | 3,853 | 380 | 221 | .. | .. | 4,454 |
| 1900..... | 4,715 | 413 | 86 | .. | .. | 5,214 |
| 1901..... | 4,879 | 387 | 148 | 18 | 12 | 5,444 |
| 1902..... | 4,508 | 336 | 138 | 16 | 11 | 5,009 |
| 1903..... | 5,088 | 420 | 149 | 24 | 17 | 5,698 |
| 1904..... | 5,190 | 371 | 146 | 20 | 20 | 5,747 |
| 1905..... | 5,126 | 276 | 153 | 22 | 23 | 5,600 |
| 1906..... | 4,841 | 286 | 186 | 22 | 29 | 5,364 |
| 1907..... | 4,591 | 225 | 121 | 11 | 32 | 4,980 |
| 1908..... | 4,370 | 215 | 116 | 12 | 28 | 4,741 |
| 1909..... | 4,163 | 209 | 84 | 15 | 44 | 4,515 |
| 1910..... | 4,113 | 183 | 114 | 16 | 14 | 4,440 |
| 1911..... | 4,006 | 152 | 110 | 5 | .. | 4,273 |
| 1912..... | 4,206 | 185 | 92 | .. | .. | 4,483 |
| 1913..... | 3,679 | 209 | 93 | .. | .. | 3,981 |
| 1914..... | 3,370 | 154 | 70 | .. | .. | 3 594 |
| 1915..... | 3,286 | 195 | 55 | .. | .. | 3,536 |
| 1916..... | 3,274 | 166 | 78 | .. | .. | 3,518 |
| 1917..... | 3,134 | 180 | 65 | .. | .. | 3,379 |

1916. The number of graduates from the nonsectarian colleges was 3,134, or 140 less than last year. The number from the homeopathic colleges was 180, or 14 more than last year, and from the eclectic there were 65 graduates, or 13 less than last year.

### GRADUATES HOLDING DEGREES IN ARTS

Of the 3,379 medical graduates, 1,099, or 32.5 per cent., were reported to hold also degrees in arts or science. This total includes those taking the combined courses in arts or science and medicine. Last year 26.9 per cent. held these degrees and 24.3 per cent. in 1915. In 1910 it is noteworthy that only 15.3 per cent. of the graduates showed this evidence of higher preliminary qualifications. Of the 3,134 nonsectarian school graduates, 1,078, or 34.4 per cent., were reported to have baccalaureate degrees; of the homeopathic graduates, 19, or 10.5 per cent., were so reported, and of the eclectic graduates, only 2, or 3.1 per cent., were reported as holding such degrees. As will be noted by referring to Table 12, of the 1,099 graduates holding baccalaureate degrees, 192—the largest number—came from the Massachusetts colleges. Last year New York furnished the largest

TABLE 7.—MEDICAL GRADUATES WITH LIBERAL ARTS DEGREES

| Year | Nonsectarian | | | Homeopathic | | | Eclectic | | | Totals | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Graduates | A.B., B.S. | Per Cent. | Graduates | A.B., B.S. | Per Cent. | Graduates | A.B., B.S. | Per Cent. | Graduates | A.B., B.S. | Per Cent. |
| 1910..... | 4,113 | 664 | 16.1 | 183 | 13 | 7.1 | 114 | 3 | 2.6 | 4,440 | 680 | 15.3 |
| 1911..... | 4,006 | 683 | 17.0 | 152 | 18 | 11.8 | 110 | 4 | 3.6 | 4,273 | 705 | 16.5 |
| 1912..... | 4,206 | 744 | 17.7 | 185 | 15 | 8.1 | 92 | 4 | 4.3 | 4,483 | 763 | 17.0 |
| 1913..... | 3,679 | 732 | 19.9 | 209 | 20 | 9.6 | 93 | 1 | 1.1 | 3,981 | 753 | 18.9 |
| 1914..... | 3,370 | 794 | 23.5 | 154 | 7 | 4.5 | 70 | 6 | 8.6 | 3,594 | 807 | 22.5 |
| 1915..... | 3,286 | 839 | 25.5 | 195 | 16 | 8.2 | 55 | 3 | 5.5 | 3,536 | 858 | 24.3 |
| 1916..... | 3,274 | 928 | 28.3 | 166 | 20 | 12.0 | 78 | 0 | 0.0 | 3,518 | 948 | 26.9 |
| 1917..... | 3,134 | 1078 | 34.4 | 180 | 19 | 10.5 | 65 | 2 | 3.1 | 3,379 | 1099 | 32.5 |

quota, and in 1915 and previous years the Illinois colleges were in the lead. Illinois comes second this year with 158, followed by New York with 133, Pennsylvania with 112 and Maryland with 74. The percentage of graduates holding collegiate degrees is rapidly increasing and will continue to increase, since most medical schools are now requiring two years of college work for admission, which brings more students in the combined course for the B.S. and M.D. degrees.

### WOMEN IN MEDICINE

During the past year there were 610 women studying medicine, or 44 more than last year and 21 less

TABLE 8.—WOMEN IN MEDICINE

| Year | Total Women Students | Percentage of All Students, Both Sexes | Total Women Graduates | Percentage of Graduates, Both Sexes | Women's Colleges | Students | Percentage of All Women Students | Graduates | Percentage of All Women Graduates | Co-ed. Schools | Students | Percentage of All Women Students | Graduates | Percentage of All Women Graduates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1904 | 1,129 | 4.3 | 244 | 4.0 | 3 | 183 | 16.2 | 56 | 23.0 | 97 | 946 | 83.8 | 198 | 77.0 |
| 1905 | 1,073 | 4.1 | 219 | 4.0 | 3 | 221 | 20.6 | 54 | 24.5 | 96 | 852 | 79.4 | 165 | 75.5 |
| 1906 | 895 | 3.5 | 233 | 4.3 | 3 | 189 | 21.0 | 33 | 14.1 | 90 | 706 | 79.0 | 200 | 85.9 |
| 1907 | 928 | 3.8 | 211 | 4.2 | 3 | 210 | 22.6 | 39 | 18.5 | 86 | 718 | 77.4 | 172 | 81.5 |
| 1908 | 835 | 3.7 | 185 | 3.9 | 3 | 186 | 22.3 | 46 | 24.9 | 88 | 649 | 77.7 | 139 | 75.1 |
| 1909 | 921 | 4.2 | 162 | 3.7 | 3 | 169 | 18.4 | 33 | 20.3 | 91 | 752 | 81.6 | 129 | 79.7 |
| 1910 | 907 | 4.2 | 157 | 3.5 | 3 | 155 | 17.1 | 41 | 26.1 | 82 | 752 | 82.9 | 116 | 73.9 |
| 1911 | 680 | 3.4 | 159 | 3.7 | 2 | 134 | 19.7 | 36 | 22.6 | 74 | 546 | 80.3 | 123 | 77.4 |
| 1912 | 679 | 3.2 | 142 | 3.2 | 2 | 143 | 21.1 | 32 | 22.5 | 64 | 536 | 78.9 | 110 | 77.5 |
| 1913 | 640 | 3.8 | 154 | 3.8 | 2 | 138 | 21.6 | 33 | 21.4 | 55 | 502 | 78.6 | 121 | 78.6 |
| 1914 | 631 | 3.8 | 121 | 3.4 | 2 | 135 | 21.4 | 25 | 20.7 | 54 | 496 | 78.6 | 96 | 79.3 |
| 1915 | 592 | 4.0 | 130 | 3.7 | 2 | 116 | 19.6 | 38 | 29.2 | 53 | 462 | 80.4 | 92 | 70.8 |
| 1916 | 566 | 4.0 | 134 | 3.8 | 2 | 102 | 18.0 | 28 | 20.0 | 51 | 464 | 82.0 | 106 | 80.0 |
| 1917 | 610 | 4.5 | 153 | 4.5 | 2 | 81 | 13.3 | 29 | 18.9 | 56 | 529 | 86.7 | 124 | 81.1 |

than in 1914. The percentage of women to all medical students is 4.5, a larger percentage than in any previous year. This is true also in regard to women graduates. There were 153 women graduates this

*(Continued on page 540)*

| Marginal Number | NAME OF COLLEGE | 1 Alabama.....161 | 2 Arizona.....11 | 3 Arkansas.....91 | 4 California.....384 | 5 Colorado.....116 | 6 Connecticut.....237 | 7 Delaware.....25 | 8 Dist. of Col.....98 | 9 Florida.....64 | 10 Georgia.....244 | 11 Idaho.....34 | 12 Illinois.....1,150 | 13 Indiana.....333 | 14 Iowa.....364 | 15 Kansas.....246 | 16 Kentucky.....185 | 17 Louisiana.....165 | 18 Maine.....89 | 19 Maryland.....200 | 20 Massachusetts..615 | Marginal Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | University of Alabama School of Medicine, Mobile | 39 | | | | | | | | | | | | | | | | 1 | | | | 1 |
| 2 | University of Arkansas Medical Dept., Little Rock | | | 36 | | | | | 1 | | | | | | | | | 2 | | | | 2 |
| 3 | College of Medical Evangelists, Loma Linda | | 3 | | 14 | 3 | | | | 1 | | 1 | | 2 | 1 | | | | | | | 3 |
| 4 | College of Phys. and Surgs., Los Angeles* | | | | 29 | 5 | | | | 1 | | | 12 | 2 | 7 | 3 | 2 | | | | 3 | 4 |
| 5 | Oakland College of Medicine and Surgery, Oakland | | | | 6 | | | | | | | | 1 | | | 1 | | | | | | 5 |
| 6 | College of Phys. and Surgs., San Francisco | | 1 | | 37 | 2 | 2 | | | | | | 2 | | | 2 | 2 | | 2 | | 1 | 6 |
| 7 | Hahnemann Medical College of the Pacific.—H. | | | | 21 | | | | | | | | | 1 | 1 | | | | 1 | | 1 | 7 |
| 8 | Leland Stanford Junior University, School of Med. | | | | 80 | 2 | | | | | | | 2 | | 1 | | | | | | | 8 |
| 9 | Univ. of California Medical School, San Francisco | | | | 120 | | | | | | | | | | | | | | | | | 9 |
| 10 | Univ. of Colorado School of Med., Boulder-Denver | | | | | 72 | | | | | | 1 | 2 | | | 1 | | | | | | 10 |
| 11 | Yale University School of Medicine, New Haven | | | | 1 | | 55 | | | | | | 4 | | | | | | | | 4 | 11 |
| 12 | Georgetown University School of Medicine | | | | | | 9 | | 19 | | | | | | | | | | 1 | 1 | 6 | 12 |
| 13 | George Washington University Medical School | 1 | | | 1 | | 2 | | 40 | | 1 | | 3 | | | 1 | | | | 3 | 2 | 13 |
| 14 | Howard University School of Medicine | 1 | | 1 | | | | 1 | 16 | 3 | 1 | | 3 | | 1 | | 5 | | | 9 | | 14 |
| 15 | Emory University School of Medicine | 17 | | | 1 | | | | | 3 | 90 | | | | | | 2 | | | | | 15 |
| 16 | University of Georgia Medical Dept., Augusta | | | | | | | | | | 53 | | | | | | | | | | | 16 |
| 17 | Chicago College of Med. and Surg., Chicago | 3 | 2 | | 2 | | 2 | | 1 | 2 | 9 | 1 | 188 | 16 | 12 | 4 | 7 | 2 | 4 | 1 | 4 | 17 |
| 18 | Chicago Hospital College of Medicine, Chicago | | | | | | | | | | | | 53 | | | | | | | | | 18 |
| 19 | Hahnemann Med. College and Hosp. of Chicago.—H. | | | | | | 1 | | | | | | 26 | 10 | 6 | 5 | | | | 1 | | 19 |
| 20 | Jenner Medical College, Chicago | | | | | | | | | | | | 118 | | | | | | | | | 20 |
| 21 | Loyola University School of Medicine, Chicago | 2 | | | 1 | 1 | 2 | | | 2 | 2 | | 133 | 5 | 3 | 1 | | | 1 | | 1 | 21 |
| 22 | Northwestern University Medical School, Chicago | | | 1 | 3 | 2 | | | | | | | 113 | 7 | 18 | 8 | 1 | 1 | | 1 | | 22 |
| 23 | Rush Medical College (University of Chicago) | 2 | 1 | 1 | 8 | 3 | 1 | | | 1 | 1 | 4 | 208 | 28 | 28 | 34 | 4 | 1 | | | 1 | 23 |
| 24 | University of Illinois College of Medicine, Chicago | 2 | | | 1 | 1 | | | | | | 2 | 119 | 2 | 25 | 3 | | 1 | 1 | | | 24 |
| 25 | Indiana University School of Medicine, Indianapolis | 1 | | | | | | | | | | | 1 | 170 | | | 1 | | | | | 25 |
| 26 | State Univ. of Iowa College of Medicine, Iowa City | | | | 2 | 1 | | | | | | 1 | 3 | | 147 | 1 | | | | | | 26 |
| 27 | State Univ. of Iowa Coll. of Homeo. Medicine.—H. | | | | | | | | | | | | | | 7 | | | | | | | 27 |
| 28 | Univ. of Kansas School of Med., Lawrence-Rosedale | | | | | | | | | | | | | | | 110 | | | | | | 28 |
| 29 | University of Louisville Medical Dept., Louisville | | | 2 | | | | | | 2 | | | 5 | 19 | 1 | 1 | 51 | | | | | 29 |
| 30 | Tulane University of Louisiana School of Medicine | 32 | | 16 | | | | | | 11 | 9 | | | | | 1 | | 130 | | | | 30 |
| 31 | Bowdoin Medical School, Brunswick-Portland | | | | | | 2 | | | | | | | | 1 | | | | | 35 | 9 | 31 |
| 32 | Johns Hopkins University Medical Dept., Baltimore | 6 | | 1 | 7 | 5 | 10 | | 2 | 3 | 11 | 4 | | 10 | 6 | 1 | 8 | 1 | 2 | 74 | 12 | 32 |
| 33 | Univ. of Maryland School of Med. & Coll. of P. & S. | 1 | 1 | 1 | 1 | | 8 | 4 | 3 | 4 | 2 | | | 1 | 1 | | 1 | | 2 | 86 | 10 | 33 |
| 34 | Boston University School of Medicine.—H. | | | | | | | | | | | | 1 | | | 1 | | | 4 | | 33 | 34 |
| 35 | College of Physicians and Surgeons, Boston | | | | | | | | | | | | | | | | | | | | 51 | 35 |
| 36 | Medical School of Harvard University, Boston | 2 | 1 | | 8 | 9 | 12 | 1 | 3 | 3 | 6 | 2 | 8 | 6 | 4 | 2 | 1 | 1 | 14 | | 148 | 36 |
| 37 | Tufts College Medical School, Boston | 1 | | | | | 15 | | | | 1 | | 1 | | | 1 | | | 10 | | 274 | 37 |
| 38 | University of Michigan Medical School | 1 | | | 2 | | 1 | | 2 | | 4 | 2 | 11 | 14 | 2 | 3 | 2 | | | | 1 | 38 |
| 39 | University of Michigan Homeo. Med. School.—H. | | | | 3 | | | 1 | | | | | 1 | 2 | 2 | | | | | 1 | | 39 |
| 40 | Detroit College of Medicine and Surgery, Detroit | | | | 1 | | | | | | 1 | | | 1 | | 1 | | | | | | 40 |
| 41 | University of Minnesota Medical School | | | | 3 | | | | | | | 2 | 1 | 1 | 12 | | | | | 1 | | 41 |
| 42 | University of Mississippi School of Med., Oxford | | | | 1 | | | | | 1 | | | | | | | | 1 | | | | 42 |
| 43 | University of Missouri School of Med., Columbia | | | 1 | | | | | | | | | 1 | | | 1 | | | | | | 43 |
| 44 | Eclectic Medical University, Kansas City.—E. | | | | | | | | | | | | | | | 11 | | | | | 1 | 44 |
| 45 | Kansas City College of Med. and Surg.—E.† | | | | | | | | | | | | | | | | | | | | | 45 |
| 46 | National University of Arts & Sciences, Med. Dept. | | | | | | | | | | | 1 | 19 | 1 | | 1 | 1 | | | | | 46 |
| 47 | St. Louis College of Phys. and Surgs., St. Louis*† | | | | | | | | | | | | 8 | | 2 | 6 | | | | | | 47 |
| 48 | St. Louis University School of Medicine | 1 | | 1 | 10 | 1 | | | | | 1 | | 41 | 7 | 21 | 16 | 1 | 2 | | 1 | 1 | 48 |
| 49 | Washington University Medical School, St. Louis | | | 4 | | 2 | | | | | | | 22 | 3 | 3 | 10 | | | | | | 49 |
| 50 | Lincoln Medical College, Lincoln.—E. | | | | | | | | | | | | | | 1 | | | | | | | 50 |
| 51 | John A. Creighton Medical College, Omaha | | | | | 1 | | | | | | | | | 17 | 6 | | | | | | 51 |
| 52 | University of Nebraska College of Med., Omaha | | | 1 | 1 | 1 | | | | | | | | | 7 | 3 | 1 | | | | | 52 |
| 53 | Dartmouth Medical School, Hanover | | | | 1 | | 1 | | | | | | 2 | | | | | | 2 | | 10 | 53 |
| 54 | Albany Medical College, Albany | | | | | | 1 | | | | | | | | | | | | | | 3 | 54 |
| 55 | University of Buffalo Dept. of Medicine, Buffalo | | | | 2 | | | | | | | | | | | 1 | | | | | 1 | 55 |
| 56 | Columbia University College of Phys. and Surgs. | | 1 | | | 2 | 22 | | | | 9 | 1 | | 3 | 1 | | 1 | | | | 2 | 56 |
| 57 | Cornell University Medical College, New York City | | | | 2 | | 7 | | 1 | | | | 1 | | | | 1 | 1 | | | 2 | 57 |
| 58 | Fordham University School of Med., New York City | | | | | | 19 | | | | | | | | | | | | | | 8 | 58 |
| 59 | Long Island College Hospital, Brooklyn | | | | | | 3 | | | | | | | | | | | | | | 1 | 59 |
| 60 | New York Homeo. Med. Coll. and Flower Hosp.—H.* | | | | 1 | | 5 | | | | | | | | | | | | 1 | | | 60 |
| 61 | New York Med. Coll. and Hospital for Women.—H. | | | | | | | | | | | | | | | | | | | | | 61 |
| 62 | Univ. and Bellevue Hosp. Med. Coll., New York City | | | | 1 | | 15 | | | 1 | 1 | | 1 | | | 1 | | | | | 1 | 62 |
| 63 | Syracuse University College of Medicine, Syracuse | | | | | | 1 | | | | | | | | | | | | | | | 63 |
| 64 | Univ. of North Carolina Sch. of Med., Chapel Hill | | | | | | | | | 1 | 1 | | | | | | | | | | | 64 |
| 65 | North Carolina Medical College, Charlotte | | | | | | | | | 1 | | | | | | | | | | | | 65 |
| 66 | Leonard Medical School, Raleigh | 2 | | | | | | | | | 1 | | | | | | | | | | | 66 |
| 67 | Wake Forest College School of Medicine, Wake Forest | | | | | 1 | | | | | | | | | | | | | | | | 67 |
| 68 | University of North Dakota School of Medicine | | | | | | | | | | | | | | | | | | | | | 68 |
| 69 | Eclectic Medical College, Cincinnati.—E. | | | | | | 1 | | | | | | 5 | 5 | 1 | 1 | 8 | | | | | 69 |
| 70 | University of Cincinnati College of Medicine | | | | 1 | | | | | | | | 1 | 5 | | | 12 | | | | | 70 |
| 71 | Western Reserve University School of Medicine | | | | | 1 | | | 1 | | | 2 | 3 | 2 | 2 | | 1 | | | | | 71 |
| 72 | Ohio State University College of Med., Columbus | | | | | | | | | 1 | | | | 1 | | | 1 | | | | | 72 |
| 73 | Ohio State Univ. Coll. of Homeo. Med., Columbus.—H. | | | | | | | | | | | | | 1 | | | 1 | | | | | 73 |
| 74 | Univ. of Okla., Sch. of Med., Norman-Oklahoma City | 1 | | 1 | | | | | | 1 | | 1 | | | | | | 1 | | | | 74 |
| 75 | University of Oregon Medical School, Portland | | | | | | | | | | | 1 | | | | | | | | | | 75 |
| 76 | Hahnemann Med. Coll. & Hosp. of Philadelphia.—H. | | | | | | 1 | 3 | 2 | | | | | | 1 | | | | | 1 | 1 | 76 |
| 77 | Jefferson Medical College of Philadelphia | 3 | | 2 | 6 | | 16 | 7 | | 1 | 1 | 2 | 5 | 1 | 1 | 1 | 1 | | 1 | 3 | 11 | 77 |
| 78 | Medico-Chirurgical College of Philadelphia | | | | 1 | | 2 | 1 | 1 | | 1 | | | 1 | | 1 | | | 1 | 1 | 1 | 78 |
| 79 | Temple University Dept. of Med., Philadelphia | | | | | | 2 | 1 | | | | | | | | | | | | 1 | | 79 |
| 80 | University of Pennsylvania School of Medicine | 1 | | | 3 | | 5 | 5 | 1 | | 3 | 1 | 8 | 4 | 7 | | | 1 | 1 | 6 | 1 | 80 |
| 81 | Woman's Medical College of Pennsylvania | | | | | | | | | | | | 1 | | | | | | | | 3 | 81 |
| 82 | University of Pittsburgh School of Med., Pittsburgh | | | | | | | | | | | | | | 1 | | | | | | | 82 |
| 83 | Medical College of the State of South Carolina | | | | | | | | 1 | 2 | 1 | | | | | | | | | | | 83 |
| 84 | University of South Dakota College of Medicine | | | | | | | | | | | | | | | | | | | | | 84 |
| 85 | Lincoln Memorial University Med. Dept., Knoxville | | | | | | | | | | | | | | | | 4 | | | | | 85 |
| 86 | University of Tennessee College of Med., Memphis | 2 | | 4 | | | | | | 2 | | 1 | 1 | | | | 2 | 7 | | | | 86 |
| 87 | Univ. of W. Tennessee Coll. of Med. & Surg., Memphis | 1 | | 3 | | | | | | | | | | | | | | 1 | | | | 87 |
| 88 | Meharry Medical College, Nashville | 20 | | 8 | | | | | 1 | 7 | 24 | | 8 | | 1 | 1 | 7 | 10 | | 1 | | 88 |
| 89 | Vanderbilt University Medical Department, Nashville | 16 | | 6 | 1 | 1 | | | | 8 | 3 | | 5 | | | | 3 | 7 | | | | 89 |
| 90 | Baylor University College of Medicine, Dallas | | | | | | | | | | 1 | | 1 | | | | | | | | | 90 |
| 91 | Fort Worth School of Medicine, Fort Worth | | | | | | | | | | | | | | | | | 1 | | | | 91 |
| 92 | University of Texas Dept. of Med., Galveston | 1 | 1 | 1 | | | | | | | 1 | 1 | | 1 | | | | 2 | 1 | | | 92 |
| 93 | University of Utah School of Med., Salt Lake City | | | | | | | | | | | 1 | | | | | | | | | | 93 |
| 94 | University of Vermont College of Med., Burlington | | | | | | 9 | | | | 1 | | | | | | | | 5 | | 8 | 94 |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |

H.—Homeopathic; E.—Eclectic. * Totals exact; distribution approximate. † Figures and distribution approximate.

| Marginal Number | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | Totals | Marginal Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Michigan....409 | Minnesota....342 | Mississippi....135 | Missouri....513 | Montana ....38 | Nebraska....261 | Nevada....4 | New Hampshire..48 | New Jersey....341 | New Mexico....9 | New York....2,113 | North Carolina.336 | North Dakota...63 | Ohio....628 | Oklahoma....116 | Oregon....83 | Pennsylvania.1,106 | Rhode Island....70 | South Carolina.134 | South Dakota...65 | Tennessee....222 | Texas....801 | Utah....94 | Vermont....53 | Virginia....294 | Washington....109 | West Virginia...136 | Wisconsin....328 | Wyoming....8 | Philippines, etc.105 | Foreign....317 | 13,764 | |
| 1 | .... | .... | 3 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | 1 | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 43 | 1 |
| 2 | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | 1 | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 43 | 2 |
| 3 | 2 | .... | .... | .... | .... | 3 | .... | .... | 1 | 1 | 1 | .... | .... | .... | .... | .... | .... | .... | .... | 1 | 2 | 3 | .... | .... | .... | 5 | .... | 1 | 1 | .... | 8 | 55 | 3 |
| 4 | 5 | 4 | .... | 4 | 1 | 10 | .... | .... | .... | .... | 5 | .... | 1 | 7 | .... | 1 | 7 | .... | .... | 2 | .... | 2 | 3 | 1 | .... | .... | .... | 5 | .... | 1 | 13 | 136 | 4 |
| 5 | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | 5 | 16 | 5 |
| 6 | .... | .... | .... | 2 | 1 | 1 | .... | .... | .... | .... | 6 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | 1 | .... | .... | 1 | .... | .... | .... | .... | 13 | 77 | 6 |
| 7 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | 2 | 3 | 32 | 7 |
| 8 | .... | .... | .... | 1 | .... | .... | 3 | .... | .... | .... | 1 | .... | .... | .... | .... | 2 | .... | .... | .... | .... | .... | .... | .... | 1 | .... | 4 | .... | .... | .... | 1 | 2 | 100 | 8 |
| 9 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | 2 | .... | .... | .... | .... | .... | .... | 2 | 1 | .... | 2 | .... | .... | .... | .... | 1 | 129 | 9 |
| 10 | .... | 1 | 1 | .... | .... | 1 | .... | .... | .... | 1 | .... | .... | .... | 2 | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | 1 | .... | .... | .... | 1 | .... | 85 | 10 |
| 11 | .... | 1 | .... | .... | .... | .... | .... | 1 | .... | .... | 6 | .... | .... | 1 | .... | .... | .... | 1 | .... | .... | 1 | .... | .... | .... | 2 | .... | .... | .... | .... | .... | .... | 77 | 11 |
| 12 | 1 | .... | .... | 1 | .... | .... | .... | .... | 1 | .... | 5 | .... | .... | 3 | 1 | .... | 7 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | 4 | .... | 60 | 12 |
| 13 | 1 | 1 | .... | .... | .... | .... | .... | 1 | 2 | 2 | 8 | 2 | .... | 2 | 1 | .... | 9 | 1 | .... | .... | 2 | .... | .... | .... | 8 | 1 | .... | 3 | .... | 5 | 11 | 114 | 13 |
| 14 | .... | .... | .... | 1 | .... | .... | .... | .... | 4 | .... | 4 | 11 | .... | 2 | 1 | .... | 6 | .... | 5 | .... | 3 | 7 | .... | .... | 13 | .... | .... | .... | .... | .... | 13 | 111 | 14 |
| 15 | .... | .... | 3 | 2 | .... | .... | .... | .... | .... | .... | .... | 11 | .... | .... | .... | .... | .... | .... | 6 | .... | 4 | 2 | .... | .... | 1 | .... | 1 | .... | .... | .... | 6 | 149 | 15 |
| 16 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 55 | 16 |
| 17 | 17 | 15 | .... | 3 | 3 | 3 | .... | .... | 2 | .... | 17 | 1 | .... | 17 | 1 | 1 | 12 | 1 | .... | 2 | 1 | 4 | 1 | .... | .... | 2 | 8 | 16 | 1 | 14 | 13 | 415 | 17 |
| 18 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 53 | 18 |
| 19 | 6 | 4 | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 4 | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | 1 | .... | .... | 6 | .... | .... | 4 | 76 | 19 |
| 20 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 118 | 20 |
| 21 | 5 | 4 | 1 | 4 | 1 | 2 | .... | .... | 1 | .... | 6 | 1 | .... | 4 | .... | .... | 5 | 1 | .... | 1 | 1 | 1 | 1 | .... | 1 | .... | 3 | 10 | .... | 12 | 9 | 228 | 21 |
| 22 | 7 | 12 | 1 | 4 | 1 | 5 | .... | .... | .... | 1 | 1 | .... | 8 | 8 | 2 | 2 | 2 | .... | .... | 6 | 1 | 2 | 1 | .... | 1 | 10 | .... | 15 | .... | .... | 2 | 247 | 22 |
| 23 | 19 | 18 | .... | 17 | 8 | 18 | .... | .... | .... | .... | 4 | .... | 8 | 12 | 5 | 7 | 6 | .... | 1 | 17 | 4 | 8 | 18 | .... | 2 | 9 | .... | 39 | .... | 4 | 6 | 567 | 23 |
| 24 | 4 | 13 | .... | 5 | .... | 1 | .... | .... | .... | .... | 1 | .... | .... | 3 | 3 | .... | 1 | .... | .... | 2 | .... | .... | 2 | .... | .... | 3 | .... | 10 | .... | .... | 8 | 213 | 24 |
| 25 | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | 175 | 25 |
| 26 | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | 3 | 162 | 26 |
| 27 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 7 | 27 |
| 28 | .... | .... | .... | 6 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 118 | 28 |
| 29 | .... | 1 | .... | 5 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | 2 | 1 | .... | 5 | .... | .... | .... | 5 | 5 | .... | .... | 3 | 2 | 7 | .... | .... | .... | .... | 118 | 29 |
| 30 | .... | 1 | 28 | 3 | .... | .... | .... | .... | .... | .... | .... | 4 | .... | .... | .... | .... | 1 | .... | 3 | .... | 1 | 26 | .... | .... | 2 | .... | .... | 1 | .... | 8 | .... | 267 | 30 |
| 31 | .... | .... | .... | .... | .... | .... | .... | 4 | .... | .... | 1 | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | 54 | 31 |
| 32 | 6 | 1 | .... | 5 | 1 | 2 | .... | .... | 8 | 1 | 28 | 7 | 6 | 23 | 1 | 4 | 37 | 4 | 6 | .... | 6 | 7 | 1 | .... | 27 | 4 | 3 | 5 | .... | .... | 3 | 359 | 32 |
| 33 | .... | .... | 1 | 1 | .... | .... | .... | 3 | 10 | .... | 17 | 31 | .... | 5 | 2 | .... | 21 | 4 | 6 | .... | .... | .... | 2 | .... | 12 | .... | 29 | .... | .... | 17 | 11 | 298 | 33 |
| 34 | .... | .... | 1 | .... | .... | .... | .... | 3 | .... | .... | .... | 1 | .... | 2 | 1 | .... | 2 | .... | 1 | .... | .... | .... | .... | 2 | .... | .... | .... | .... | .... | .... | 10 | 62 | 34 |
| 35 | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | 53 | 35 |
| 36 | 2 | 6 | .... | 5 | .... | 1 | .... | 4 | 3 | .... | 22 | 7 | .... | 11 | 1 | .... | 9 | 16 | 2 | .... | 2 | 7 | 7 | 2 | 1 | 3 | .... | 6 | .... | .... | 9 | 357 | 36 |
| 37 | 1 | .... | .... | .... | .... | .... | .... | 14 | 1 | .... | 16 | .... | .... | 2 | .... | .... | 6 | 28 | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | 3 | 8 | 383 | 37 |
| 38 | 155 | 4 | .... | 3 | 1 | 1 | .... | .... | 2 | .... | 27 | .... | .... | 28 | 1 | .... | 18 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | .... | 7 | .... | .... | .... | 6 | 14 | 322 | 38 |
| 39 | 24 | 2 | .... | .... | .... | .... | .... | .... | .... | .... | 4 | .... | .... | 4 | 1 | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | 1 | .... | .... | .... | .... | 48 | 39 |
| 40 | 131 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 | .... | .... | 3 | .... | .... | 1 | .... | .... | .... | .... | 1 | .... | .... | .... | 1 | .... | 1 | .... | .... | 17 | 161 | 40 |
| 41 | 1 | 215 | .... | 1 | 1 | 1 | .... | .... | .... | .... | 1 | .... | 10 | 1 | .... | .... | .... | .... | .... | 3 | .... | .... | .... | .... | .... | 5 | .... | 4 | .... | .... | 2 | 265 | 41 |
| 42 | .... | .... | 51 | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | 4 | 60 | 42 |
| 43 | .... | .... | .... | 77 | .... | 2 | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | 1 | .... | 85 | 43 |
| 44 | .... | .... | .... | 20 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 31 | 44 |
| 45 | .... | .... | .... | 114 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 114 | 45 |
| 46 | .... | .... | .... | 37 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | 1 | .... | 1 | .... | .... | 1 | .... | 64 | 46 |
| 47 | .... | .... | .... | 30 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 46 | 47 |
| 48 | 9 | 6 | .... | 71 | 1 | 3 | .... | .... | .... | .... | 3 | .... | .... | 23 | 2 | 1 | 3 | .... | .... | .... | .... | 5 | 1 | .... | .... | 7 | .... | 8 | .... | 3 | 4 | 254 | 48 |
| 49 | .... | 1 | .... | 61 | .... | .... | .... | .... | .... | .... | 1 | 1 | .... | 1 | 2 | .... | .... | .... | .... | .... | .... | 2 | 2 | .... | .... | .... | .... | 10 | .... | .... | 1 | 125 | 49 |
| 50 | .... | .... | .... | .... | .... | 15 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | 17 | 50 |
| 51 | 1 | 3 | .... | 1 | 11 | 57 | .... | .... | .... | .... | 1 | .... | .... | 1 | .... | 1 | .... | .... | .... | 3 | .... | .... | .... | 1 | .... | 2 | .... | 1 | 1 | .... | .... | 108 | 51 |
| 52 | 1 | .... | .... | .... | .... | 126 | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | 3 | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | 3 | 143 | 52 |
| 53 | .... | .... | .... | .... | .... | 1 | .... | 10 | 2 | .... | 6 | .... | .... | 1 | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | 2 | 40 | 53 |
| 54 | .... | .... | .... | .... | .... | .... | .... | .... | 2 | .... | 103 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | 110 | 54 |
| 55 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 184 | .... | .... | 1 | .... | .... | 7 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 196 | 55 |
| 56 | 2 | 4 | 2 | 2 | .... | .... | .... | 3 | 56 | 1 | 324 | 4 | .... | 3 | 1 | 2 | 7 | 3 | 2 | .... | 2 | 3 | 8 | 1 | 4 | 2 | 2 | 4 | 1 | .... | 6 | 491 | 56 |
| 57 | .... | .... | .... | .... | .... | 4 | .... | .... | 15 | .... | 117 | 1 | .... | 2 | .... | .... | 3 | 1 | .... | .... | .... | 1 | .... | 1 | .... | 1 | 1 | .... | 1 | 1 | .... | 1 | 165 | 57 |
| 58 | .... | .... | .... | .... | .... | .... | .... | .... | 24 | .... | 240 | .... | .... | .... | .... | .... | 2 | 2 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | 1 | 297 | 58 |
| 59 | .... | .... | .... | .... | .... | .... | .... | .... | 15 | .... | 260 | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | 5 | 295 | 59 |
| 60 | 1 | .... | .... | .... | .... | .... | .... | .... | 24 | .... | 130 | .... | .... | .... | .... | .... | 3 | .... | .... | .... | .... | 1 | .... | 1 | .... | .... | .... | .... | .... | .... | 3 | 170 | 60 |
| 61 | .... | .... | .... | .... | .... | .... | .... | .... | 9 | .... | 29 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 38 | 61 |
| 62 | .... | .... | 1 | .... | .... | 1 | .... | .... | 61 | .... | 228 | 2 | .... | 2 | .... | .... | .... | 3 | .... | .... | 1 | 1 | 3 | 1 | .... | 1 | .... | .... | .... | 1 | 2 | 429 | 62 |
| 63 | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | 114 | .... | .... | 1 | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | 3 | 2 | 124 | 63 |
| 64 | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | 55 | .... | .... | .... | .... | .... | .... | 4 | .... | .... | .... | .... | .... | 2 | .... | .... | .... | .... | .... | .... | 64 | 64 |
| 65 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 16 | .... | .... | .... | .... | .... | .... | 2 | .... | .... | .... | .... | .... | 2 | .... | .... | .... | .... | .... | .... | 21 | 65 |
| 66 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 | 2 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 8 | 66 |
| 67 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 28 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 | .... | .... | .... | .... | .... | 1 | 22 | 67 |
| 68 | .... | 6 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 26 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | 33 | 68 |
| 69 | 1 | .... | .... | 1 | .... | 2 | .... | .... | .... | .... | 2 | .... | .... | 57 | 1 | .... | 4 | .... | .... | .... | 1 | .... | .... | .... | .... | 1 | 6 | .... | .... | .... | .... | 97 | 69 |
| 70 | 1 | 1 | .... | 1 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | 66 | .... | .... | 2 | .... | .... | .... | .... | 1 | .... | .... | 1 | .... | 1 | .... | .... | .... | .... | 94 | 70 |
| 71 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 | .... | .... | 120 | .... | .... | 8 | .... | .... | 2 | .... | .... | 3 | .... | 1 | .... | 3 | .... | .... | .... | 4 | 165 | 71 |
| 72 | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | 130 | .... | .... | 4 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 | 1 | .... | .... | .... | 142 | 72 |
| 73 | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | 29 | .... | .... | 3 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 36 | 73 |
| 74 | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | 75 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | 2 | 85 | 74 |
| 75 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 59 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 12 | .... | .... | .... | .... | .... | 72 | 75 |
| 76 | .... | .... | .... | 1 | .... | .... | .... | .... | 12 | .... | 3 | .... | .... | 6 | .... | .... | 74 | .... | .... | .... | .... | .... | .... | .... | 2 | 1 | .... | .... | .... | .... | 3 | 111 | 76 |
| 77 | 1 | 4 | 1 | 5 | 4 | 3 | .... | .... | 35 | .... | 15 | 40 | 2 | 11 | .... | 1 | 275 | 1 | 11 | .... | 2 | 2 | 9 | 1 | 4 | 5 | 7 | 10 | .... | 2 | 27 | 540 | 77 |
| 78 | .... | 1 | .... | .... | .... | .... | .... | .... | 14 | .... | 5 | .... | 1 | .... | .... | .... | 144 | .... | .... | 1 | .... | .... | 2 | .... | 1 | .... | 1 | 1 | .... | 1 | 1 | 184 | 78 |
| 79 | .... | .... | .... | .... | .... | .... | .... | .... | 4 | .... | 6 | .... | .... | 2 | .... | .... | 61 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | 1 | 4 | 83 | 79 |
| 80 | .... | 2 | 2 | 1 | 2 | 2 | .... | .... | 24 | .... | 13 | 26 | .... | 4 | .... | .... | 205 | .... | 4 | .... | 4 | 4 | 5 | .... | 8 | 12 | 5 | 10 | .... | 3 | 18 | 401 | 80 |
| 81 | 2 | .... | .... | .... | .... | .... | .... | 1 | 1 | .... | 5 | 5 | .... | .... | .... | .... | 22 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 3 | 43 | 81 |
| 82 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 4 | .... | .... | 110 | .... | .... | 1 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | 117 | 82 |
| 83 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | 52 | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | 1 | 59 | 83 |
| 84 | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | 15 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 17 | 84 |
| 85 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 5 | 85 |
| 86 | .... | .... | 16 | 1 | .... | .... | .... | .... | .... | .... | .... | 3 | .... | 1 | .... | .... | .... | .... | .... | .... | 65 | 12 | .... | .... | 1 | 1 | 2 | .... | .... | 1 | .... | 122 | 86 |
| 87 | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | 3 | .... | .... | 3 | .... | .... | .... | .... | .... | 5 | 2 | .... | .... | .... | .... | 1 | .... | .... | .... | .... | 20 | 87 |
| 88 | .... | .... | 18 | 8 | .... | .... | .... | .... | 1 | .... | .... | 17 | .... | .... | 3 | .... | 2 | .... | 18 | .... | 37 | 33 | .... | .... | 10 | .... | .... | .... | .... | .... | 20 | 255 | 88 |
| 89 | .... | 1 | 1 | 4 | .... | .... | .... | .... | .... | 1 | 1 | 1 | .... | .... | 2 | .... | .... | .... | 1 | .... | 71 | 16 | .... | .... | .... | .... | 1 | .... | 1 | .... | 1 | 152 | 89 |
| 90 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | 41 | .... | .... | .... | .... | .... | .... | .... | 1 | .... | 45 | 90 |
| 91 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 54 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 55 | 91 |
| 92 | .... | .... | 1 | .... | .... | .... | .... | .... | .... | 1 | .... | 1 | .... | .... | 1 | .... | 1 | .... | .... | .... | .... | 238 | .... | .... | 1 | .... | .... | .... | .... | 1 | 1 | 255 | 92 |
| 93 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 20 | .... | .... | .... | .... | .... | 1 | .... | .... | 22 | 93 |
| 94 | .... | .... | .... | .... | .... | .... | .... | 4 | 2 | .... | 13 | .... | .... | 1 | .... | .... | 1 | 1 | .... | .... | .... | .... | .... | 37 | .... | .... | .... | .... | .... | .... | .... | 82 | 94 |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | | |

| Marginal Number | NAME OF COLLEGE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Marginal Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Alabama.....161 | Arizona.....11 | Arkansas.....91 | California.....384 | Colorado.....116 | Connecticut...257 | Delaware.....25 | Dist. of Col.....98 | Florida.....64 | Georgia.....244 | Idaho.....34 | Illinois.....1,159 | Indiana.....333 | Iowa.....364 | Kansas.....246 | Kentucky.....135 | Louisiana.....165 | Maine.....89 | Maryland.....200 | Massachusetts..615 | |
| 95 | Medical College of Virginia, Richmond | .... | .... | .... | 1 | .... | 3 | .... | 1 | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 6 | .... | 95 |
| 96 | University of Virginia Dept. of Med., Charlottesville | 2 | .... | .... | .... | .... | 2 | 1 | 2 | 1 | 4 | .... | .... | 1 | .... | .... | 2 | 1 | .... | 2 | .... | 96 |
| 97 | West Virginia Univ. School of Med., Morgantown | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | 97 |
| 98 | University of Wisconsin Medical School, Madison | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 | 7 | .... | .... | 1 | 1 | .... | .... | .... | .... | 98 |
| 99 | Marquette University School of Medicine, Milwaukee | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | 99 |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |

H.—Homeopathic; E.—Eclectic * Totals exact; distribution approximate. † Figures and distribution approximate.

(Continued from page 537)

year, 19 more than last year and 32 more than in 1914. Of all the women matriculants, a smaller percentage were in attendance at the two medical colleges for women, while 529 (86.7 per cent.) were matriculated in the 56 coeducational colleges. From the two women's colleges there were 29 graduates, while 124 secured their degrees from coeducational colleges. This increase of women students in coeducation colleges is not surprising, since in recent years some of the largest and oldest medical schools, such as Columbia, Tulane and the University of Pennsylvania, have thrown open their doors to women.

TABLE 9.—MEDICAL COLLEGES

| Year | Non-sectarian | Homeopathic | Eclectic | Physio-Med. | Nondescript | Total |
|---|---|---|---|---|---|---|
| 1850 | 44 | 3 | 4 | 1 | .. | 52 |
| 1860 | 53 | 6 | 4 | 2 | .. | 65 |
| 1870 | 60 | 8 | 5 | 2 | .. | 75 |
| 1880 | 76 | 14 | 8 | 2 | .. | 100 |
| 1890 | 106 | 16 | 9 | 2 | .. | 133 |
| 1900 | 136 | 22 | 9 | 2 | 1 | 160 |
| 1901 | 125 | 22 | 10 | 2 | 1 | 160 |
| 1902 | 126 | 20 | 9 | 3 | 2 | 160 |
| 1903 | 126 | 20 | 9 | 3 | 2 | 160 |
| 1904 | 127 | 19 | 9 | 3 | 2 | 160 |
| 1905 | 125 | 19 | 9 | 3 | 2 | 158 |
| 1906 | 130 | 19 | 8 | 3 | 2 | 162 |
| 1907 | 127 | 18 | 9 | 3 | 2 | 159 |
| 1908 | 120 | 18 | 9 | 2 | 2 | 151 |
| 1909 | 115 | 15 | 8 | 1 | 1 | 140 |
| 1910 | 109 | 12 | 8 | 1 | 1 | 131 |
| 1911 | 103 | 12 | 7 | .. | .. | 122 |
| 1912 | 101 | 11 | 6 | .. | .. | 118 |
| 1913 | 92 | 10 | 5 | .. | .. | 107 |
| 1914 | 87 | 10 | 5 | .. | .. | 102 |
| 1915 | 83 | 9 | 4 | .. | .. | 96 |
| 1916 | 82 | 10 | 3 | .. | .. | 95 |
| 1917 | 83 | 9 | 4 | .. | .. | 96 |

Since June 30, 1916, two medical colleges were reestablished and one college (mentioned on page 544) was suspended. The present total number of medical colleges is 96—one more than last year.

### LENGTH OF TERMS

During the last seventeen years there has been a decided lengthening of college terms. This has reference to the weeks of actual work exclusive of holidays. For two years no colleges have had sessions shorter than 29 weeks, and this year only one college reported a session of 30 weeks. Sessions of from 33 to 36 weeks were reported by 77, or 80.2 per cent. of all colleges.

### TUITION AND OTHER FEES

Attention is called to Table 1, on page 534, to the amount charged by the various medical colleges per annum for tuition, matriculation, laboratory and graduation fees for each student. In Table 11, 95 of the 96 colleges—from one class C college the figures were not obtained — have been grouped according to the amount of fees charged and according to their classification by the Council on Medical Education in Classes A, B and C. Sixteen colleges charge fees of $100 or less per year; fifty-three between $100 and $175, and twenty-six charge above $175. Of the sixteen colleges charging $100 or less, twelve (75 per cent.) are listed among Class A (acceptable) colleges[2] by the Council on Medical Education; three are Class B colleges and one is rated in Class C. Among the twelve Class A colleges having these low fees are the schools of medicine of the state universities of Colorado, Iowa, Michigan, Mississippi, Missouri, North Dakota, South Dakota, Texas and Utah. On the other hand, nine colleges listed by the Council in Class C charge fees of from $100 to $175 per year for each student, and two exact fees between $175 and $200. As shown on page 550, diplomas from Class C colleges are reported as not recognized by thirty-two state licensing boards. No intelligent student would knowingly spend his time and money in a low-grade

TABLE 10.—COLLEGE TERMS

| Year | 23 to 26 weeks | | 27 to 28 weeks | | 29 to 30 weeks | | 31 to 32 weeks | | 33 to 34 weeks | | 35 to 36 weeks | | Over 36 weeks | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 1901 | 58 | 36.5 | 42 | 26.4 | 8 | 5.0 | 26 | 16.4 | 4 | 2.5 | 18 | 11.3 | 3 | 1.9 |
| 1902 | 44 | 28.4 | 44 | 28.4 | 11 | 7.1 | 33 | 21.3 | 3 | 1.9 | 18 | 11.6 | 2 | 1.3 |
| 1903 | 33 | 21.4 | 46 | 29.9 | 15 | 9.7 | 37 | 24.0 | 2 | 1.3 | 19 | 12.4 | 2 | 1.3 |
| 1904 | 27 | 16.3 | 44 | 26.5 | 22 | 13.3 | 37 | 22.3 | 13 | 7.8 | 20 | 12.0 | 3 | 1.8 |
| 1905 | 15 | 9.4 | 35 | 21.8 | 12 | 7.5 | 44 | 27.5 | 13 | 8.1 | 28 | 22.8 | 3 | 1.9 |
| 1906 | 14 | 8.7 | 35 | 21.7 | 26 | 16.1 | 32 | 19.9 | 24 | 14.9 | 28 | 17.4 | 2 | 1.3 |
| 1907 | 6 | 3.7 | 27 | 16.8 | 26 | 16.1 | 42 | 26.1 | 29 | 18.0 | 29 | 18.0 | 2 | 1.3 |
| 1908 | 2 | 1.3 | 21 | 13.8 | 28 | 18.4 | 51 | 33.6 | 24 | 15.8 | 22 | 14.5 | 4 | 2.6 |
| 1909 | 4 | 2.3 | 17 | 11.6 | 22 | 16.4 | 51 | 34.9 | 18 | 12.3 | 30 | 20.5 | 3 | 2.0 |
| 1910 | 2 | 1.5 | 8 | 6.0 | 19 | 14.3 | 42 | 31.5 | 30 | 22.6 | 30 | 22.6 | 2 | 1.5 |
| 1911 | .. | .... | 6 | 5.0 | 16 | 13.3 | 37 | 30.8 | 32 | 26.7 | 28 | 23.4 | 1 | 0.8 |
| 1912 | 1 | 0.9 | 1 | 0.9 | 11 | 9.5 | 34 | 29.3 | 37 | 31.8 | 31 | 26.7 | 1 | 0.9 |
| 1913 | .. | .... | 3 | 2.8 | 5 | 4.7 | 29 | 27.4 | 41 | 38.7 | 27 | 25.5 | 1 | 0.9 |
| 1914 | .. | .... | 2 | 2.0 | 4 | 4.0 | 25 | 24.8 | 41 | 40.5 | 28 | 27.7 | 1 | 1.0 |
| 1915 | .. | .... | 1 | 1.0 | 5 | 5.3 | 22 | 23.2 | 36 | 37.9 | 30 | 31.6 | 1 | 1.0 |
| 1916* | .. | .... | .. | .... | 4 | 4.2 | 17 | 17.9 | 43 | 45.3 | 28 | 29.5 | .. | ... |
| 1917* | .. | .... | .. | .... | 1 | 1.0 | 15 | 15.6 | 46 | 47.9 | 31 | 32.3 | .. | ... |

* Information not obtained from three Class C colleges.

2. See Classification of Medical Colleges, page 548.

| Marginal Number | 21 Michigan.....409 | 22 Minnesota.....342 | 23 Mississippi.....135 | 24 Missouri.....513 | 25 Montana .....38 | 26 Nebraska.....261 | 27 Nevada.....4 | 28 New Hampshire..48 | 29 New Jersey.....341 | 30 New Mexico.....9 | 31 New York.....2,113 | 32 North Carolina.336 | 33 North Dakota...62 | 34 Ohio.....628 | 35 Oklahoma.....116 | 36 Oregon.....85 | 37 Pennsylvania.1,106 | 38 Rhode Island....70 | 39 South Carolina.134 | 40 South Dakota...65 | 41 Tennessee.....232 | 42 Texas.....501 | 43 Utah.....94 | 44 Vermont.....53 | 45 Virginia.....294 | 46 Washington....109 | 47 West Virginia...136 | 48 Wisconsin.....328 | 49 Wyoming.....8 | 50 Philippines, etc.105 | 51 Foreign.....317 | Totals.....13,764 | Marginal Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 95 | .... | .... | 1 | .... | .... | .... | .... | .... | 1 | .... | 4 | 45 | .... | 2 | 1 | .... | 3 | 1 | 2 | .... | .... | 1 | .... | .... | 116 | .... | 14 | .... | .... | 3 | .... | 206 | 95 |
| 96 | .... | .... | 1 | .... | .... | .... | .... | .... | 1 | .... | .... | 8 | .... | .... | .... | .... | 3 | .... | 4 | .... | 6 | 1 | .... | .... | 61 | .... | 4 | .... | .... | .... | 1 | 108 | 96 |
| 97 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | 30 | .... | .... | 2 | .... | 34 | 97 |
| 98 | 1 | 2 | .... | .... | 2 | 2 | .... | .... | .... | .... | 2 | .... | 1 | .... | .... | .... | .... | .... | .... | 1 | 1 | .... | .... | .... | .... | .... | 1 | 108 | .... | .... | .... | 132 | 98 |
| 99 | 1 | 4 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 50 | .... | .... | .... | 57 | 99 |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | | |

college, the diplomas of which are not recognized by many states,[3] when in the same time and for even less money he could attend one of the best-equipped colleges, the diplomas of which are recognized everywhere. Although fifty colleges listed in Class A charge fees ranging from $150 to $275 per year for each student, the actual expense for teaching that student in these colleges amounts to from two or three to several times these sums. In fact, accurate data secured from eighty-two medical colleges show that the average amount received each year from the individual student was $150, while the average amount actually expended in the training of that student for a year was $419! And among these eighty-two colleges were several which still apparently made profits from teaching medical students or which paid all expenses, including rents, or even erected new buildings which are being paid for out of the income from students' fees!

TABLE 11.—College Fees

| Total Fees | Number of Colleges | | | |
|---|---|---|---|---|
| | Class A* | Class B | Class C | Total |
| $ 50 or less..... | 3 | 2 | .. | 5 |
| 50 to $ 75..... | 5 | 1 | 1 | 7 |
| 75 to 100..... | 4 | .. | .. | 4 |
| 100 to 125..... | 8 | 4 | 1 | 13 |
| 125 to 150..... | 9 | 1 | 6 | 16 |
| 150 to 175..... | 18 | 4 | 2 | 24 |
| 175 to 200..... | 12 | 1 | 2 | 15 |
| 200 or above..... | 10 | 1 | .. | 11 |
| Totals..... | 69 | 14 | 12 | 95† |

* Based on the latest classification of medical colleges prepared by the Council on Medical Education (see page 548).
† Information not obtained for one Class C college.

## SCHOLARSHIPS IN MEDICAL SCHOOLS

As evidence that provision is being made for worthy students, regardless of their financial status, 287 scholarships are reported this year in the following thirty-eight medical schools:

| | |
|---|---|
| University of Alabama School of Medicine, Mobile | 66 |
| Hahnemann Medical College of the Pacific, San Francisco | 1 |
| University of California Medical School,* San Francisco | 3 |
| University of Colorado School of Medicine,* Boulder | 1 |
| Yale University School of Medicine, New Haven, Conn | 2 |
| Hahnemann Medical College and Hospital of Chicago* | 6 |
| Loyola University School of Medicine, Chicago | 3 |
| Rush Medical College, Chicago | 7 |
| University of Illinois College of Medicine, Chicago | 7 |
| Indiana University School of Medicine, Indianapolis | 12 |
| Johns Hopkins University Medical Department, Baltimore | 6 |
| University of Maryland School of Medicine,* Baltimore | 6 |
| Medical School of Harvard University,* Boston | 52 |
| Detroit College of Medicine and Surgery | 6 |
| University of Minnesota Medical School,* Minneapolis | 1 |
| Washington University Medical School, St. Louis | 4 |
| Dartmouth Medical School,* Hanover, N. H | 2 |
| Albany Medical College, Albany, N. Y | 4 |
| New York Medical College and Hospital for Women, New York City | 2 |
| University and Bellevue Hospital Medical College, New York City | 1 |
| University of Buffalo Department of Medicine* | 1 |
| University of North Carolina School of Medicine, Chapel Hill | 1 |
| University of Cincinnati College of Medicine* | 12 |
| Western Reserve University School of Medicine, Cleveland | 1 |
| University of Oregon Department of Medicine,* Portland | 3 |
| Hahnemann Medical College and Hospital of Philadelphia* | 12 |
| Jefferson Medical College of Philadelphia | 1 |
| Temple University Department of Medicine, Philadelphia | 3 |
| University of Pennsylvania School of Medicine,* Philadelphia | 3 |
| Woman's Medical College of Pennsylvania,* Philadelphia | 15 |
| Medical College of the State of South Carolina, Charleston | 8 |
| University of Tennessee College of Medicine, Memphis | 1 |
| Vanderbilt University Medical Department, Nashville, Tenn | 4 |
| Baylor University College of Medicine, Dallas, Tex | 3 |
| University of Texas Department of Medicine,* Galveston | 1 |
| Medical College of Virginia, Richmond | 15 |
| University of Virginia Department of Medicine, Charlottesville | 2 |
| West Virginia University School of Medicine, Morgantown | 8 |
| Total in 38 medical schools | 287 |

* Have loan funds also.

## LOAN FUNDS

The colleges marked by an asterisk (*) also have loan funds for deserving but needy students. Such funds are available also at the following medical schools:

Leland Stanford Jr. University School of Medicine, San Francisco, Cal.
College of Medical Evangelists, Loma Linda, Cal.
Yale University School of Medicine, New Haven, Conn.
Howard University School of Medicine, Washington, D. C.
University of Kansas, School of Medicine, Lawrence, Kan.
Tulane University of Louisiana School of Medicine, New Orleans, La.
University of Missouri School of Medicine, Columbia, Mo.
University of Nebraska College of Medicine, Omaha, Neb.
University of North Dakota, School of Medicine, University, N. D.
University of Wisconsin Medical School, Madison, Wis.

## COLLEGES, STUDENTS AND GRADUATES BY STATES

Illinois formerly had the largest number of medical colleges, but for the last two years the first place is held by New York, where there are ten colleges. Illinois has eight; California and Missouri each has seven and Pennsylvania has six colleges. Of Class C colleges, however, Missouri leads with 4, and California and Illinois each has 2. For the last two years New York has had the largest number of students enrolled, this year having 2,223, followed by Illinois with 1,802 and Pennsylvania with 1,411. In

*(Continued on page 544)*

3. See also The Journal, April 14, 1917, page 1112, Table D, which shows in what states diplomas granted by various colleges are not recognized as an acceptable qualification for the license to practice.

## TABLE 3.—MEDICAL STUDENTS SHOWN BY CLASSES

| Name of College | Enrolled During 1916-17 | | | | |
|---|---|---|---|---|---|
| | 1st Yr. | 2d Yr. | 3d Yr. | 4th Yr. | Total |
| University of Alabama School of Medicine | 8 | 5 | 7 | 23 | 43 |
| Univ. of Arkansas Medical Dept., Little Rock | 5 | 6 | 17 | 15 | 43 |
| College of Medical Evangelists, Loma Linda | 17 | 3 | 22 | 13 | 55 |
| College of Phys. and Surgs., Los Angeles | 21 | 38 | 28 | 49 | 136 |
| Oakland College of Med. and Surg., Oakland | 4 | 4 | 4 | 4 | 16 |
| College of Phys. and Surgs., San Francisco | 30 | 11 | 25 | 11 | 77 |
| Hahnemann Med. Coll. of the Pacific.—H. | ..... | ..... | 14 | 18 | 32 |
| Leland Stanford Junior Univ. School of Med. | 34 | 19 | 20 | 27 | 100 |
| University of California Medical School | 48 | 30 | 24 | 27 | 129 |
| University of Colorado School of Medicine | 25 | 29 | 10 | 21 | 85 |
| Yale University School of Med., New Haven | 32 | 25 | 9 | 11 | 77 |
| Georgetown University School of Medicine | 17 | 11 | 17 | 15 | 60 |
| George Washington University Medical School | 47 | 15 | 15 | 37 | 114 |
| Howard University School of Medicine | 34 | 28 | 32 | 19 | 111 |
| Emory University School of Medicine, Atlanta | 33 | 27 | 23 | 66 | 149 |
| University of Georgia Medical Department | 28 | 10 | 6 | 11 | 55 |
| Chicago College of Medicine and Surgery | 66 | 43 | 89 | 217 | 415 |
| Chicago Hospital College of Medicine | 10 | 12 | 11 | 20 | 53 |
| Hahnemann Medical College and Hospital.—H. | 11 | 18 | 16 | 31 | 76 |
| Jenner Medical College, Chicago | 45 | ..... | 45 | 28 | 118 |
| Loyola University School of Medicine, Chicago | 47 | 33 | 47 | 101 | 228 |
| Northwestern University Med. School, Chicago | 63 | 71 | 67 | 46 | 247 |
| Rush Medical College, Chicago | 142 | 142 | 139 | 144 | 567 |
| University of Illinois College of Medicine | 89 | 47 | 27 | 50 | 213 |
| Indiana University School of Medicine | 68 | 33 | 34 | 40 | 175 |
| State Univ. of Iowa Coll. of Med., Iowa City | 59 | 49 | 33 | 21 | 162 |
| State Univ. of Iowa Coll. of Homeo. Med., Iowa City.—H. | 2 | 1 | 3 | 1 | 7 |
| University of Kansas School of Medicine | 48 | 34 | 17 | 19 | 118 |
| University of Louisville Medical Department | 21 | 16 | 12 | 69 | 118 |
| Tulane Univ. of Louisiana School of Medicine | 94 | 61 | 58 | 54 | 267 |
| Bowdoin Medical School, Brunswick-Portland | 10 | 15 | 19 | 10 | 54 |
| Johns Hopkins University Medical Dept. | 90 | 90 | 87 | 92 | 359 |
| University of Maryland School of Medicine and College of Physicians and Surgeons | 79 | 56 | 61 | 102 | 298 |
| Boston University School of Medicine.—H. | 13 | 10 | 11 | 28 | 62 |
| College of Phys. and Surgs., Boston | 23 | 8 | 11 | 11 | 53 |
| Medical School of Harvard University | 109 | 87 | 93 | 68 | 357 |
| Tufts College Medical School, Boston | 105 | 121 | 74 | 83 | 383 |
| Univ. of Michigan Med. School, Ann Arbor | 117 | 73 | 70 | 62 | 322 |
| Univ. of Michigan Homeo. Med. School.—H. | 10 | 11 | 13 | 14 | 48 |
| Detroit College of Medicine and Surgery | 46 | 29 | 22 | 64 | 161 |
| University of Minnesota Medical School | 75 | 76 | 68 | 46 | 265 |
| University of Mississippi Dept. of Medicine | 29 | 31 | ..... | ..... | 60 |
| University of Missouri School of Medicine | 49 | 36 | ..... | ..... | 85 |
| Eclectic Medical University, Kansas City.—E.* | 4 | 6 | 10 | 11 | 31 |
| Kansas City College of Med. and Surg.—E.† | 22 | 30 | 40 | 22 | 114 |
| National Univ. of Arts and Sciences Med. Dept. | ..... | ..... | 26 | 38 | 64 |
| St. Louis Coll. of Phys. & Surgs., St. Louis* | 10 | 10 | 15 | 11 | 46 |
| St. Louis University School of Medicine | 83 | 68 | 53 | 50 | 254 |
| Washington University Med. School, St. Louis | 36 | 23 | 34 | 32 | 125 |
| Lincoln Medical College, Lincoln.—E. | 4 | 6 | 3 | 4 | 17 |
| John A. Creighton Medical College | 25 | 23 | 16 | 44 | 108 |
| University of Nebraska College of Medicine | 58 | 40 | 27 | 18 | 143 |
| Dartmouth Medical School, Hanover | 20 | 20 | ..... | ..... | 40 |
| Albany Medical College, Albany | 33 | 14 | 21 | 42 | 110 |
| Univ. of Buffalo Dept. of Medicine, Buffalo | 66 | 41 | 29 | 60 | 196 |
| Columbia Univ. Coll. of Phys. and Surgs. | 147 | 130 | 118 | 96 | 491 |
| Cornell Univ. Medical College, New York City | 66 | 39 | 32 | 28 | 165 |
| Fordham University School of Medicine | 104 | 79 | 65 | 49 | 297 |
| Long Island College Hospital, Brooklyn | 107 | 60 | 49 | 79 | 295 |
| New York Homeopathic Medical College and Flower Hospital.—H. | 44 | 22 | 47 | 57 | 170 |
| New York Med. Coll. & Hosp. for Women.—H. | 6 | 16 | 4 | 12 | 38 |
| Univ. & Bellevue Hosp. Med. Coll., N. Y. City | 167 | 102 | 96 | 65 | 429 |
| Syracuse University College of Medicine | 44 | 26 | 24 | 30 | 124 |
| University of North Carolina School of Med. | 30 | 34 | 0 | 0 | 64 |
| North Carolina Medical College, Charlotte | ..... | 2 | 1 | 18 | 21 |
| Leonard Medical School, Raleigh | 6 | 2 | ..... | ..... | 8 |
| Wake Forest College School of Medicine | 15 | 17 | ..... | ..... | 32 |
| University of North Dakota School of Medicine | 18 | 15 | ..... | ..... | 33 |
| Eclectic Medical College, Cincinnati.—E. | 20 | 22 | 24 | 31 | 97 |
| University of Cincinnati College of Medicine | 37 | 21 | 22 | 14 | 94 |
| Western Reserve University School of Medicine | 53 | 37 | 42 | 33 | 165 |
| Ohio State University College of Medicine | 31 | 17 | 26 | 68 | 142 |
| Ohio State Univ. College of Homeo. Med.—H. | 2 | 10 | 15 | 9 | 36 |
| University of Oklahoma School of Medicine | 27 | 21 | 13 | 24 | 85 |
| University of Oregon Med. School, Portland | 16 | 23 | 21 | 12 | 72 |
| Hahnemann Med. Coll. & Hosp. of Phila.—H. | 31 | 32 | 10 | 38 | 111 |
| Jefferson Medical College of Philadelphia | 179 | 115 | 105 | 141 | 540 |
| Medico-Chirurgical College of Philadelphia | 39 | 54 | ..... | 91 | 184 |
| Temple University Dept. of Med., Philadelphia | 13 | 17 | 17 | 36 | 83 |
| University of Pennsylvania School of Medicine | 118 | 77 | 133 | 73 | 401 |
| Woman's Medical College of Pennsylvania | 10 | 8 | 7 | 18 | 43 |
| University of Pittsburgh School of Medicine | 42 | 31 | 25 | 19 | 117 |
| Medical Coll. of the State of South Carolina | 14 | 10 | 10 | 25 | 59 |
| University of South Dakota College of Med. | 12 | 5 | ..... | ..... | 17 |
| Lincoln Memorial University Medical Dept. | ..... | ..... | ..... | 5 | 5 |
| University of Tennessee College of Medicine | 23 | 14 | 22 | 63 | 122 |
| Univ. of West Tennessee Coll. of Med. & Surg. | 5 | 4 | 6 | 5 | 20 |
| Meharry Medical College, Nashville | 38 | 36 | 79 | 102 | 255 |
| Vanderbilt University Medical Dept., Nashville | 29 | 25 | 21 | 77 | 152 |
| Baylor University College of Medicine, Dallas | 11 | 10 | 13 | 11 | 45 |
| Fort Worth School of Medicine | 19 | 13 | 6 | 17 | 55 |
| University of Texas Department of Medicine | 95 | 64 | 45 | 51 | 255 |
| University of Utah School of Medicine | 15 | 7 | ..... | ..... | 22 |
| University of Vermont College of Medicine | 23 | 20 | 21 | 18 | 82 |
| Medical College of Virginia, Richmond | 31 | 28 | 42 | 105 | 206 |
| University of Virginia Department of Medicine | 30 | 30 | 25 | 23 | 108 |
| West Virginia University School of Medicine | 20 | 14 | 0 | 0 | 34 |
| University of Wisconsin Medical School | 79 | 53 | ..... | ..... | 132 |
| Marquette University School of Medicine | 27 | 12 | 7 | 11 | 57 |
| Totals for 1917 | 4107 | 3117 | 2866 | 3674 | 13764 |
| Totals for 1916 | 3582 | 3064 | 3559 | 3727 | 14022 |
| Totals for 1915 | 3373 | 3919 | 3675 | 2864 | 14891 |

H.—Homeopathic; E.—Eclectic. * Totals exact; distribution approximate. † Total and distribution approximate.

## TABLE 4.—AVERAGE AGE OF GRADUATES OF 1917

### GROUP 1.—ADMISSION REQUIREMENTS—1913—A HIGH SCHOOL EDUCATION

| Colleges | Number of Graduates at Various Ages | | | | | | | | | | | | | | | | | Total Students | Total Years | Aver. Age |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Under 21 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | Over 25 | | | |
| University of Alabama | ..... | 1 | 2 | 1 | 3 | 6 | 2 | 1 | ..... | 2 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 18 | 447 | 24.8 |
| University of Arkansas | ..... | ..... | ..... | 3 | 1 | 3 | 1 | ..... | 1 | ..... | 1 | 1 | ..... | ..... | ..... | 1 | 3 | 15 | 436 | 29.1 |
| College of Medical Evangelists | ..... | ..... | 1 | 1 | ..... | ..... | 3 | 1 | 1 | ..... | 1 | ..... | 1 | 1 | 1 | ..... | 2 | 13 | 386 | 29.7 |
| Oakland College of Med. and Surg. | ..... | 1 | ..... | ..... | 1 | ..... | ..... | ..... | ..... | 1 | ..... | ..... | ..... | ..... | ..... | ..... | 1 | 4 | 122 | 30.5 |
| Coll. of Phys. & Surg., San Francisco | ..... | ..... | ..... | ..... | 2 | ..... | ..... | ..... | ..... | 1 | 3 | ..... | ..... | ..... | ..... | ..... | 1 | 7 | 203 | 29.0 |
| Hahnemann Med. Coll. of the Pacific | ..... | ..... | ..... | 1 | 3 | 3 | 2 | 2 | 1 | 1 | ..... | ..... | 1 | 1 | 1 | ..... | 2 | 18 | 524 | 29.1 |
| George Washington University | ..... | ..... | 7 | 9 | 4 | 3 | 6 | 3 | 1 | 1 | 1 | ..... | ..... | ..... | 1 | 2 | 3 | 41 | 1,071 | 26.1 |
| Emory University School of Medicine | ..... | 1 | 8 | 9 | 7 | 10 | 4 | 3 | 6 | 6 | 5 | 1 | ..... | ..... | 2 | ..... | 1 | 63 | 1,651 | 26.2 |
| University of Georgia | ..... | ..... | 2 | 1 | 1 | 3 | ..... | 2 | 1 | ..... | ..... | ..... | ..... | 1 | ..... | ..... | ..... | 11 | 281 | 25.5 |
| Hahnemann, Chicago | ..... | ..... | 1 | 2 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 1 | ..... | 4 | 2 | 30 | 885 | 29.5 |
| Jenner Medical College | ..... | ..... | ..... | 1 | 2 | 1 | 3 | 3 | ..... | ..... | ..... | ..... | 1 | ..... | ..... | 2 | 1 | 14 | 395 | 28.2 |
| Loyola University | ..... | 1 | 2 | 3 | 10 | 8 | 8 | 7 | 2 | 4 | 5 | 4 | 5 | 6 | 5 | 4 | 9 | 83 | 2,430 | 29.1 |
| University of Louisville | ..... | ..... | 3 | 7 | 8 | 12 | 6 | 9 | 6 | ..... | 3 | 2 | 2 | 1 | ..... | 1 | 5 | 65 | 1,761 | 27.1 |
| University of Maryland | ..... | 1 | 9 | 17 | 15 | 12 | 7 | 5 | 3 | 2 | 3 | 3 | 3 | ..... | ..... | ..... | 2 | 82 | 2,091 | 25.5 |
| Boston University | ..... | 2 | ..... | 2 | 4 | 3 | 4 | 3 | 1 | ..... | ..... | 1 | ..... | 2 | ..... | 2 | ..... | 24 | 639 | 26.6 |
| Tufts College | ..... | 1 | 8 | 16 | 9 | 12 | 11 | 7 | 2 | 3 | ..... | 3 | 1 | 2 | ..... | ..... | 1 | 76 | 1,932 | 25.4 |
| Detroit College of Med. and Surg. | ..... | 1 | 3 | 12 | 13 | 12 | 8 | 2 | 5 | 1 | 1 | 1 | 1 | 1 | ..... | 1 | 1 | 63 | 1,605 | 25.5 |
| Eclectic Medical University | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1 | ..... | ..... | 1 | ..... | 1 | 1 | 4 | 134 | 33.5 |
| Kansas City College of Med. and Surg. | ..... | ..... | ..... | ..... | 1 | ..... | 1 | ..... | 2 | ..... | ..... | 2 | ..... | ..... | 1 | 2 | 6 | 15 | 504 | 33.6 |
| National Univ. of Arts and Sciences | ..... | ..... | 1 | 4 | 5 | 5 | 6 | 6 | 3 | ..... | 1 | 1 | 1 | 1 | 2 | 1 | ..... | 37 | 990 | 26.7 |
| Creighton Medical College | ..... | 3 | 4 | 9 | 7 | 3 | 4 | 3 | 4 | 4 | 1 | ..... | 1 | ..... | ..... | ..... | ..... | 43 | 1,076 | 25.0 |
| Albany Medical College | ..... | ..... | 4 | 10 | 3 | 8 | 7 | 7 | 1 | ..... | 1 | 1 | ..... | ..... | ..... | ..... | ..... | 42 | 1,050 | 25.0 |
| University of Buffalo | 1 | 3 | 5 | 15 | 11 | 6 | 3 | 3 | 4 | 1 | ..... | 4 | 2 | ..... | ..... | ..... | 2 | 60 | 1,525 | 25.4 |
| Long Island College Hospital | ..... | 6 | 12 | 7 | 9 | 13 | 11 | 4 | 1 | 4 | 1 | ..... | 1 | 1 | ..... | ..... | ..... | 70 | 1,725 | 24.6 |
| North Carolina Medical College | ..... | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 2 | 3 | ..... | 2 | ..... | ..... | ..... | ..... | ..... | 17 | 446 | 26.2 |
| Eclectic Medical College | ..... | ..... | 2 | 2 | 2 | 5 | 9 | 2 | 2 | ..... | 3 | ..... | 1 | ..... | ..... | ..... | 1 | 29 | 771 | 26.6 |
| Ohio State University College of Med. | ..... | 1 | 5 | 6 | 12 | 13 | 5 | 4 | 11 | 2 | 3 | 1 | ..... | 2 | ..... | ..... | ..... | 65 | 1,673 | 25.7 |
| Ohio State University, Homeopathic | ..... | ..... | ..... | 2 | 1 | ..... | 1 | 2 | ..... | ..... | 1 | ..... | ..... | ..... | ..... | ..... | 1 | 8 | 219 | 27.4 |
| University of Oklahoma | ..... | ..... | 1 | 4 | 3 | 4 | 1 | 1 | ..... | ..... | 1 | 1 | 3 | ..... | ..... | 1 | 4 | 24 | 679 | 28.3 |
| Jefferson Medical College | ..... | 1 | 13 | 18 | 29 | 28 | 12 | 13 | 8 | 7 | 7 | ..... | 1 | 1 | 1 | ..... | 1 | 140 | 3,553 | 25.4 |

## TABLE 4.—AVERAGE AGE OF GRADUATES OF 1917—(Concluded)

### GROUP 1.—ADMISSION REQUIREMENTS—1913—A HIGH SCHOOL EDUCATION

| Colleges | Number of Graduates at Various Ages | | | | | | | | | | | | | | | | Total Students | Total Years | Aver. Age |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Under 21 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | Over 35 | | | |
| Medico-Chirurgical Coll. of Philadelphia | ..... | 1 | 7 | 9 | 19 | 12 | 12 | 8 | 8 | 3 | 3 | ..... | 1 | 2 | ..... | ..... | ..... | 85 | 2,165 | 25.5 |
| Temple University | ..... | ..... | ..... | 1 | 2 | 4 | 1 | 1 | 5 | 1 | 1 | ..... | 1 | 1 | ..... | 1 | ..... | 19 | 523 | 27.5 |
| Medical College of South Carolina | ..... | 1 | 1 | 1 | 3 | 7 | 5 | 1 | 1 | ..... | 2 | 2 | ..... | ..... | ..... | ..... | ..... | 24 | 620 | 25.8 |
| Lincoln Memorial University | ..... | ..... | ..... | ..... | ..... | 2 | ..... | ..... | ..... | ..... | 1 | ..... | ..... | ..... | ..... | ..... | 1 | 4 | 120 | 30.0 |
| University of Tennessee | ..... | ..... | 3 | 5 | 13 | 6 | 6 | 4 | 6 | 4 | 1 | 3 | 1 | 1 | 1 | ..... | 4 | 58 | 1,570 | 27.1 |
| University of West Tennessee | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1 | ..... | ..... | ..... | 1 | 1 | ..... | 1 | ..... | ..... | 4 | 124 | 31.0 |
| Meharry Medical College | ..... | ..... | ..... | 4 | 7 | 7 | 15 | 15 | 11 | 12 | 7 | 8 | 3 | 1 | 3 | ..... | 5 | 98 | 2,763 | 28.2 |
| Vanderbilt University | ..... | 6 | 17 | 11 | 21 | 7 | 4 | 3 | 2 | 1 | 1 | 1 | ..... | ..... | ..... | 1 | ..... | 75 | 1,798 | 24.0 |
| Fort Worth School of Medicine | ..... | 1 | 2 | 1 | 1 | ..... | 1 | 1 | 1 | 1 | 2 | 1 | ..... | 1 | ..... | ..... | ..... | 13 | 346 | 26.6 |
| Medical College of Virginia | ..... | 2 | 4 | 8 | 20 | 22 | 8 | 10 | 9 | 6 | 3 | 2 | ..... | 1 | ..... | ..... | ..... | 95 | 2,433 | 25.6 |
| Marquette University | ..... | ..... | ..... | 1 | 2 | 4 | 1 | 1 | ..... | 1 | ..... | ..... | ..... | ..... | ..... | ..... | 2 | 12 | 331 | 27.6 |
| Totals, 41 colleges | 1 | 35 | 128 | 204 | 260 | 249 | 181 | 141 | 113 | 73 | 66 | 48 | 35 | 29 | 19 | 24 | 62 | 1,668 | 43,987 | 26.4 |
| Percentage | 0.6 | 2.1 | 7.6 | 12.2 | 15.6 | 14.9 | 10.8 | 8.4 | 6.7 | 4.3 | 3.9 | 2.9 | 2.1 | 1.7 | 1.4 | 1.4 | 3.7 | | | |

### GROUP 2.—ADMISSION REQUIREMENTS—1913—ONE YEAR OF COLLEGE WORK

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Howard University | ..... | ..... | ..... | ..... | 1 | 2 | 1 | 3 | 2 | 1 | 1 | ..... | 1 | ..... | ..... | ..... | 1 | 13 | 366 | 28.1 |
| University of Illinois | ..... | ..... | 1 | 6 | 4 | 4 | 3 | 13 | 4 | 5 | 5 | 2 | ..... | ..... | 2 | ..... | ..... | 49 | 1,322 | 27.0 |
| Tulane University of Louisiana | ..... | ..... | 3 | 11 | 12 | 5 | 4 | 4 | 5 | 1 | 3 | 1 | ..... | 1 | ..... | 2 | ..... | 52 | 1,337 | 25.7 |
| Bowdoin Medical School | ..... | ..... | ..... | ..... | 1 | 1 | 4 | 1 | ..... | 1 | ..... | ..... | ..... | ..... | ..... | ..... | 2 | 10 | 288 | 28.8 |
| St. Louis University | ..... | ..... | ..... | 3 | 4 | 11 | 10 | 7 | 4 | 1 | ..... | ..... | ..... | ..... | ..... | ..... | 1 | 41 | 1,066 | 26.0 |
| Fordham University | ..... | ..... | 1 | 5 | 10 | 7 | 7 | 3 | 5 | 3 | 3 | 1 | ..... | 1 | 1 | ..... | 2 | 49 | 1,308 | 26.7 |
| University and Bellevue Hospital | ..... | ..... | 6 | 16 | 20 | 5 | 8 | 1 | 2 | 2 | ..... | ..... | ..... | ..... | 1 | 1 | 2 | 64 | 1,606 | 25.1 |
| University of Oregon | ..... | ..... | ..... | ..... | 1 | 1 | 1 | 5 | ..... | ..... | 2 | ..... | ..... | ..... | ..... | ..... | 2 | 12 | 347 | 28.9 |
| Hahnemann, Philadelphia | ..... | 1 | 7 | 6 | 4 | 5 | 4 | 2 | 5 | 2 | 1 | ..... | ..... | ..... | ..... | ..... | ..... | 37 | 920 | 24.9 |
| Woman's Med. Coll. of Pennsylvania | ..... | ..... | 1 | 1 | 4 | 1 | 1 | 1 | 2 | ..... | 1 | ..... | ..... | ..... | 3 | 1 | 1 | 17 | 482 | 28.3 |
| Baylor University | ..... | ..... | 1 | ..... | ..... | 3 | ..... | 4 | 2 | ..... | ..... | ..... | ..... | 1 | ..... | ..... | ..... | 11 | 294 | 26.7 |
| University of Texas | ..... | ..... | 1 | 4 | 7 | 6 | 4 | 8 | 6 | 10 | 2 | 2 | ..... | ..... | ..... | ..... | ..... | 50 | 1,332 | 26.6 |
| University of Vermont | ..... | ..... | ..... | 2 | 4 | ..... | 4 | 2 | ..... | 1 | 3 | ..... | ..... | 2 | ..... | ..... | ..... | 18 | 485 | 26.9 |
| University of Virginia | ..... | ..... | 1 | 2 | 4 | 8 | 3 | 3 | ..... | ..... | 1 | ..... | 1 | ..... | ..... | ..... | ..... | 23 | 685 | 25.4 |
| Totals, 14 colleges | ..... | 1 | 22 | 56 | 76 | 59 | 54 | 57 | 37 | 27 | 22 | 6 | 2 | 5 | 7 | 4 | 11 | 446 | 11,738 | 26.3 |
| Percentages | ..... | 0.2 | 4.9 | 12.6 | 17.0 | 13.2 | 12.1 | 12.8 | 8.3 | 6.1 | 4.9 | 1.3 | 0.5 | 1.1 | 1.6 | 0.9 | 2.5 | | | |

### GROUP 3.—ADMISSION REQUIREMENTS—1913—TWO OR MORE YEARS OF COLLEGE WORK

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Leland Stanford Junior | ..... | ..... | ..... | ..... | ..... | 3 | 2 | 5 | 7 | 3 | 1 | ..... | ..... | 1 | ..... | ..... | 1 | 23 | 644 | 28.0 |
| University of California | ..... | ..... | ..... | 1 | 2 | 6 | 7 | 4 | 3 | ..... | 1 | ..... | ..... | 1 | ..... | ..... | 1 | 26 | 695 | 26.7 |
| University of Colorado | ..... | ..... | ..... | 1 | 4 | 7 | 2 | 1 | 2 | ..... | ..... | 2 | 1 | 1 | ..... | ..... | ..... | 21 | 556 | 26.5 |
| Yale University | ..... | ..... | ..... | ..... | 1 | 4 | 2 | 2 | ..... | 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 10 | 259 | 25.9 |
| Georgetown University | ..... | ..... | ..... | 2 | 1 | 3 | 2 | ..... | 4 | ..... | ..... | ..... | ..... | 1 | ..... | ..... | ..... | 13 | 342 | 26.9 |
| Northwestern University | ..... | ..... | 2 | 2 | 5 | 12 | 3 | 3 | 3 | 5 | 2 | 1 | 1 | 3 | ..... | ..... | ..... | 42 | 1,120 | 26.7 |
| Rush Medical College | ..... | ..... | ..... | 5 | 18 | 25 | 21 | 19 | 6 | 6 | 4 | 5 | 5 | 3 | 1 | ..... | 4 | 122 | 3,292 | 27.0 |
| Indiana University | ..... | ..... | 1 | ..... | 3 | 5 | 7 | 6 | 3 | 5 | 1 | 2 | 1 | ..... | 2 | ..... | 1 | 37 | 1,025 | 27.7 |
| State University of Iowa | ..... | ..... | ..... | ..... | 1 | 2 | 7 | 3 | 3 | 2 | ..... | ..... | ..... | ..... | 1 | ..... | 1 | 20 | 550 | 27.5 |
| State University of Iowa, Homeopathic | ..... | ..... | ..... | 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1 | 23 | 23.0 |
| University of Kansas | ..... | ..... | 1 | 1 | 2 | 5 | 4 | 1 | 2 | 1 | ..... | 1 | ..... | ..... | ..... | ..... | 1 | 19 | 501 | 26.4 |
| Johns Hopkins University | ..... | ..... | ..... | ..... | 7 | 25 | 18 | 18 | 9 | 2 | 3 | ..... | 2 | 1 | 1 | 1 | 2 | 80 | 2,394 | 26.9 |
| Medical School of Harvard University | ..... | ..... | ..... | 1 | 7 | 16 | 13 | 11 | 11 | 2 | 2 | ..... | 3 | ..... | ..... | ..... | 1 | 67 | 1,784 | 26.6 |
| University of Michigan Medical School | ..... | ..... | ..... | 2 | 11 | 14 | 10 | 10 | 7 | 5 | ..... | ..... | 2 | ..... | ..... | ..... | 1 | 62 | 1,632 | 26.3 |
| University of Minnesota | ..... | ..... | ..... | ..... | 1 | 6 | 3 | 3 | 2 | 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 16 | 418 | 26.1 |
| Washington University | ..... | ..... | 2 | 2 | 9 | 6 | 5 | 3 | 2 | ..... | ..... | ..... | 1 | 1 | ..... | ..... | ..... | 31 | 788 | 25.4 |
| University of Nebraska | ..... | ..... | ..... | 1 | ..... | 6 | 5 | 1 | 1 | ..... | 1 | 1 | ..... | 1 | ..... | ..... | ..... | 17 | 452 | 26.6 |
| Columbia University | ..... | ..... | 3 | 14 | 12 | 18 | 12 | 8 | 9 | 5 | 1 | 4 | 3 | ..... | ..... | 1 | ..... | 90 | 2,336 | 25.9 |
| Cornell University | ..... | ..... | 1 | 1 | 2 | 7 | 9 | 3 | 1 | 2 | ..... | ..... | ..... | 1 | ..... | ..... | ..... | 27 | 702 | 26.0 |
| Syracuse University | ..... | ..... | 2 | 3 | 2 | 8 | 9 | 3 | ..... | ..... | 1 | ..... | ..... | ..... | ..... | ..... | 1 | 29 | 753 | 26.0 |
| University of Cincinnati | ..... | ..... | ..... | 1 | 2 | 3 | 1 | 2 | 2 | ..... | ..... | 1 | 1 | ..... | ..... | ..... | 1 | 14 | 382 | 27.3 |
| Western Reserve University | ..... | ..... | ..... | ..... | 2 | 6 | 4 | 9 | 3 | 1 | 3 | 1 | 2 | ..... | ..... | ..... | 1 | 32 | 881 | 27.5 |
| University of Pennsylvania | ..... | ..... | ..... | 5 | 5 | 23 | 15 | 6 | 4 | 6 | 1 | 1 | 1 | 2 | 2 | ..... | 2 | 73 | 1,949 | 26.7 |
| University of Pittsburgh | ..... | ..... | ..... | 1 | 7 | 4 | 2 | 2 | ..... | 1 | 1 | ..... | 1 | ..... | 1 | ..... | ..... | 20 | 522 | 26.1 |
| Totals, 24 colleges | ..... | ..... | 12 | 44 | 104 | 214 | 163 | 123 | 84 | 48 | 22 | 19 | 24 | 16 | 8 | 2 | 18 | 901 | 24,000 | 26.6 |
| Percentages | ..... | ..... | 1.3 | 4.9 | 11.5 | 23.8 | 18.1 | 13.7 | 9.3 | 5.3 | 2.4 | 2.1 | 2.7 | 1.8 | 0.9 | 0.2 | 2.0 | | | |
| Grand totals (79 colleges) | 1 | 36 | 162 | 304 | 440 | 522 | 398 | 321 | 234 | 148 | 110 | 73 | 61 | 50 | 34 | 30 | 91 | 3,015 | 79,725 | 26.4 |
| Percentage of all graduates at each age | 0.2 | 1.2 | 5.4 | 10.1 | 14.6 | 17.3 | 13.2 | 10.6 | 7.8 | 4.9 | 3.6 | 2.4 | 2.0 | 1.6 | 1.1 | 1.0 | 3.0 | | | |

This table shows the average ages of the graduates of the 79 medical colleges from which information in regard to age was obtained. The colleges are arranged in three groups, according to the entrance requirements in 1913, at the time these graduates matriculated. Group 1 is those which required a high school education; Group 2 those which required one year of college work, and Group 3 those which required two or more years of college work. At the bottom of each group table the totals and percentages of graduates of each age are given. The grand totals and the percentages of all graduates of the 79 colleges are given under the table for Group 3. It would be expected that the average age of graduates under Groups 2 and 3 would be one and two years higher, respectively, than that of Group 1. That such is not the case is due to the fact that more students of advanced age matriculated in the 41 medical colleges in Group 1. Note that 62 students in the colleges of this group were over 35 years of age at the time they graduated, one college having nine such graduates. In fact, of the 62, 18 were 40 years or over, the oldest being 53. The two highest averages, 33.5 and 33.6, were obtained by two colleges of Kansas City, neither of which is reported as recognized by the Missouri State Board of Health.

The lowest average age of all graduates in Group 1 was 24.0 for Vanderbilt University, Nashville; in Group 2 the lowest average age was 24.9, for Hahnemann Medical College of Philadelphia, and in Group 3, omitting a college which had only one graduate, the lowest average was 25.4, obtained by the Washington University, St. Louis. In this comparison we find the expected differences, due, undoubtedly, to differences in entrance requirements. In Group 1 the largest number of students, 260 (15.6 per cent.), were 24 years of age. In Group 2 likewise the largest number, 76 (17 per cent.), were 24 years of age; while in Group 3 the largest number, 214 (23.8 per cent.), were 25 years of age. Higher standards for admission clearly affect the minimum age at graduation, but the most important factor in high averages is the late time when many students enter on the study of medicine.

*(Continued from page 541)*

regard to the graduates, Illinois leads with 531, followed by New York with 485, Pennsylvania with 401, and Tennessee with 239.

Table 13 shows the students and graduates of the last five years grouped according to the rank of the colleges in the classification of the Council on Medical Education. Note that during the five years the percentage of students enrolled in Class A colleges has increased from 65.4 to 82.2 and that the total attendance of 1917 shows an increase over the total for the

TABLE 12.—MEDICAL COLLEGES, STUDENTS AND GRADUATES BY STATES

| State | College | | Students | | Graduates | | Graduates with B.S. or A.B. |
|---|---|---|---|---|---|---|---|
| | Total | Class C | Men | Women | Men | Women | |
| Alabama | 1 | .. | 43 | .... | 18 | .... | 1 |
| Arkansas | 1 | .. | 43 | .... | 15 | .... | 1 |
| California | 7 | 2 | 477 | 68 | 116 | 25 | 43 |
| Colorado | 1 | .. | 81 | 4 | 20 | 1 | 16 |
| Connecticut | 1 | .. | 74 | 3 | 10 | .... | 9 |
| Dist. of Columbia | 3 | .. | 276 | 9 | 66 | 1 | 15 |
| Georgia | 2 | .. | 204 | .... | 74 | .... | 6 |
| Illinois | 8 | 2 | 1,862 | 115 | 497 | 34 | 158 |
| Indiana | 1 | .. | 169 | 6 | 37 | .... | 29 |
| Iowa | 2 | .. | 165 | 4 | 21 | .... | 8 |
| Kansas | 1 | .. | 110 | 8 | 19 | .... | 15 |
| Kentucky | 1 | .. | 118 | .... | 66 | .... | 4 |
| Louisiana | 1 | .. | 250 | 17 | 51 | 1 | 18 |
| Maine | 1 | .. | 54 | .... | 10 | .... | 4 |
| Maryland | 2 | .. | 615 | 42 | 165 | 9 | 74 |
| Massachusetts | 4 | 1 | 800 | 46 | 165 | 13 | 192 |
| Michigan | 3 | .. | 511 | 20 | 130 | 4 | 56 |
| Minnesota | 1 | .. | 256 | 9 | 17 | .... | 13 |
| Mississippi | 1 | .. | 69 | .... | .... | .... | .... |
| Missouri | 7 | 4 | 692 | 27 | 144 | 9 | 37 |
| Nebraska | 3 | 1 | 261 | 7 | 61 | 2 | 29 |
| New Hampshire | 1 | .. | 40 | .... | .... | .... | .... |
| New York | 10 | 1 | 2,223 | 92 | 462 | 23 | 133 |
| North Carolina | 3 | .. | 125 | .... | 17 | .... | .... |
| North Dakota | 1 | .. | 32 | 1 | .... | .... | .... |
| Ohio | 5 | .. | 510 | 24 | 144 | 4 | 46 |
| Oklahoma | 1 | .. | 81 | 4 | 24 | .... | 2 |
| Oregon | 1 | .. | 69 | 3 | 11 | 1 | 4 |
| Pennsylvania | 6 | .. | 1,411 | 68 | 381 | 20 | 112 |
| South Carolina | 1 | .. | 59 | .... | 24 | .... | 8 |
| South Dakota | 1 | .. | 16 | 1 | .... | .... | .... |
| Tennessee | 4 | 1 | 546 | 8 | 236 | 3 | 31 |
| Texas | 3 | .. | 337 | 18 | 75 | 3 | 13 |
| Utah | 1 | .. | 22 | .... | .... | .... | .... |
| Vermont | 1 | .. | 82 | .... | 18 | .... | 3 |
| Virginia | 2 | .. | 314 | .... | 119 | .... | 18 |
| West Virginia | 1 | .. | 33 | 1 | .... | .... | .... |
| Wisconsin | 2 | .. | 181 | 8 | 13 | .... | 10 |
| Totals | 96 | 12 | 13,151 | 613 | 3,226 | 153 | 1,069 |

TABLE 13.—STUDENTS AND GRADUATES ACCORDING TO CLASSIFICATION

| Year | Students | | | | | | Graduates | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Colleges Rated in Class | | | | | | Colleges Rated in Class | | | | | |
| | A | % | B | % | C | % | A | % | B | % | C | % |
| 1913 | 11,122 | 65.4 | 4,158 | 24.4 | 1,735 | 10.2 | 2,539 | 63.8 | 1,050 | 26.4 | 392 | 9.8 |
| 1914 | 12,336 | 74.7 | 2,838 | 17.2 | 1,328 | 8.1 | 2,626 | 73.1 | 686 | 19.1 | 282 | 7.8 |
| 1915 | 11,314 | 76.0 | 2,668 | 17.9 | 909 | 6.1 | 2,629 | 74.4 | 688 | 19.4 | 219 | 6.2 |
| 1916 | 11,162 | 79.6 | 2,087 | 14.9 | 773 | 5.5 | 2,630 | 74.7 | 695 | 19.8 | 193 | 5.5 |
| 1917 | 11,317 | 82.2 | 1,761 | 12.8 | 686 | 5.0 | 2,577 | 76.3 | 648 | 19.2 | 154 | 4.5 |

two previous years. Note, on the other hand, that the percentage of students in Class B colleges has been reduced from 24.4 to 12.8 and in Class C colleges from 10.2 to 5.0. Of graduates, also, the percentage in Class A colleges shows an increase; in Class B colleges it is nearly at a standstill, while in Class C colleges there has been a decrease. *It is evident, therefore, that the reduction in the total numbers of students and graduates has been in the lower grade colleges, while the numbers of students and graduates in the higher grade colleges are actually increasing.*

## COLLEGE NOTES

**College Closed.**—One medical college, the Southwest School of Medicine and Hospital of Kansas City, Mo., was closed permanently in 1916.

**Colleges Reestablished.**—Two medical colleges have been reestablished. The Eclectic Medical University of Kansas City, which had no classes during 1915-16, was reopened in 1916. The St. Louis College of Physicians and Surgeons was merged in 1915 with the Medical Department of the National University of Arts and Sciences, but in 1916 was reestablished as a separate institution.

### Special Items Concerning Medical Education

**Alabama.**—The city commissioners of Mobile appropriated $10,000 for the erection of a modern operating room at the City Hospital, for the use of the University of Alabama School of Medicine.

**Arkansas.**—The Arkansas General Assembly appropriated $52,708 for the Medical Department of the University of Arkansas for the biennium ending June 30, 1919, of which $17,258 is for maintenance and improvement. Another bill provided for the sale of certain lands, to secure a sum estimated at $150,000 for the erection of a new state hospital in Little Rock to be used as the teaching hospital of the Medical Department of the University of Arkansas and be controlled by the trustees of the university. The new Isaac Folsom Clinic building has been completed at a cost of $55,000.

**California.**—The College of Medical Evangelists received $55,218 for the purchase of ground and the erection of a hospital in Los Angeles.

——Leland Stanford Junior University School of Medicine has adopted the quarter system, to begin Oct. 1, 1917, thus providing a continuous session, any three quarters of which will constitute a college year. The new Stanford University Hospital has been erected at a cost of approximately $500,000.

——The University of California Medical School received sums amounting to $43,493 to furnish and equip the new University Hospital. The institution received from Mrs. A. F. Morrison $1,500 for the purchase of an ophthalmologic library.

**Connecticut.**—Yale University School of Medicine received $100,000 from Mrs. E. H. Harriman to establish a department of orthopedics, to be shared with the University Department of Health. Pledges amounting to $250,000 have been made for the endowment fund of the School of Medicine. The university also received $260,000 for the equipment of the Yale Mobile Hospital Unit, and other gifts amounting to $6,000. The Brady Memorial Laboratory, presented to Yale University as a memorial to the late Anthony N. Brady, has been completed and equipped at a cost of approximately $175,000. It is situated on the grounds of the New Haven Hospital, and will house the departments of pathology, bacteriology, pathologic chemistry, obstetrics and gynecology, and medicine.

**Georgia.**—An outpatient building, costing $75,000, has been completed on the campus of Emory University School of Medicine in Atlanta. Buildings for anatomy, physiology and chemistry, costing, respectively, $90,000, $98,000 and $54,000, have been erected on the main campus of Emory University.

**Illinois.**—The University of Chicago, by raising $3,461,500, has secured the fund of $2,000,000 offered by the Rockefeller Foundation and the General Education Board for the organization of medical instruction at the university. The money will be used to establish undergraduate and graduate medical schools and a foundation for medical research. The undergraduate medical school will be directly connected with the University on the South Side. The Billings Memorial Hospital, at a cost of $1,000,000, will also be erected on the Midway. It will contain 250 beds, will have $3,000,000 endowment, and will be utilized for teaching and clinical study. On the West Side, Rush Medical College, the Presbyterian Hospital and the Central Free Dispensary will be combined to form the new graduate medical school. A new laboratory building costing $300,000 will be erected on the site of the old Rush Medical College building. The heads of the departments of medicine, surgery and obstetrics and all laboratory men in both the undergraduate and graduate schools will be full-time salaried instructors.

**Indiana.**—The Indiana University School of Medicine is to have a new medical school building to cost about $400,000, which will be erected adjoining the Robert W. Long Hospital, the teaching hospital of the university. It is expected the building will be ready for occupancy in the fall of 1918.

**Maryland.**—Johns Hopkins University Medical Department received $350,000 from the General Education Board, of which

$250,000 will be used for the departments of pathology, physical chemistry and several minor branches of the laboratory department, and $100,000 for the department of pediatrics. The School of Hygiene and Public Health of the university, which will be opened in October, received $70,000 for maintenance from the Rockefeller Foundation. A bequest of $300,000 to the Johns Hopkins Hospital, for the erection of the Brady Urological Institute, was provided by the will of James Buchanan Brady.

——The Maryland legislature, at its last session, appropriated $25,000 a year for two years and ordered the payment of $30,000 to the medical school of the University of Maryland, which amount had been appropriated by a previous legislature, but never paid. The school has acquired property on West Lombard Street on which a central outdoor obstetrical clinic will be established.

**Nebraska.**—The University of Nebraska College of Medicine received from the state legislature an appropriation of $350,000 for the next biennium. Part of the amount will be used in the erection of another laboratory building, an exact duplicate of the one now occupied. The University Hospital, the teaching institution of the University of Nebraska College of Medicine, which, with the equipment, cost approximately $210,000, has been completed.

**New York.**—The Albany Medical College received $10,000 from members of the board of trustees and other donors.

——Columbia University College of Physicians and Surgeons received from Mrs. Clara L. McMurtry, in memory of her son, Dr. Charles Wood McMurtry, the entire furnishings of his library, valued at $7,000. The school also received a donation of 600 volumes, valued at $3,000, from Dr. Frederic S. Lee, and a valuable collection of specimens and medical apparatus from Dr. Herbert N. Gorham. The institution received $1,000 from Willard V. King, to be applied to the medical school removal and rebuilding.

——A bequest of $500,000 for the endowment fund of Cornell University Medical College was provided by the will of Col. Hazard Payne.

——The faculty of the Long Island College Hospital has voted to make the institution coeducational. Friends of the late Dr. John A. McCorkle have added to his bequest of $50,000 the sum of $100,000, which is to be known as the McCorkle Memorial Fund, the income from which may be used as the board of the Long Island College Hospital may direct. The school also received $20,000 by the will of Francis S. C. A. Ripley.

——The New York Medical College and Hospital for Women received $3,000 from Mr. W. Dominick for the endowment of the library.

——The University of Buffalo Department of Medicine was given $2,000 by Dr. Clara A. March, to be known as the Frank Miller March Memorial Fund and loaned to needy students.

**Ohio.**—The residuary estate of Mrs. Anna Hunt Heady, estimated at $100,000, was bequeathed to the University of Cincinnati to endow a chair in the medical department, in the name of Dr. James F. Heady.

——Western Reserve University School of Medicine and two allied hospitals have been given land valued at $350,000. The School of Medicine also received $300,000 for the erection of new buildings on this land.

**Oklahoma.**—The state legislature at its last session appropriated $200,000 for the building and equipment of a hospital at Oklahoma City, to be under the supervision of the School of Medicine of the University of Oklahoma.

**Oregon.**—The University of Oregon Department of Medicine received an appropriation of $100,000 from the state legislature.

**Pennsylvania.**—The Hahnemann Medical College and Hospital of Philadelphia received $40,000 by the will of Marcus N. Darr, and $5,000 by the will of Dr. L. H. Adams, for its endowment fund. The school also received $20,000 from an anonymous donor, to be used in the assistance of needy students, and two donations of $1,000 each for laboratory apparatus. By the will of the late Dr. Louis L. Posey, his library, consisting of about 2,000 volumes, was given to the institution.

——The Jefferson Medical College of Philadelphia received gifts amounting, approximately, to $70,000, for its endowment fund.

——The Woman's Medical College of Pennsylvania has secured an additional $150,000 for its endowment fund. Of this amount, about $50,000 was given for scholarship endowments, the rest being unrestricted.

**Tennessee.**—Meharry Medical College received $7,500 from the Carnegie Foundation for the Advancement of Teaching, and a similar amount from the General Education Board for general maintenance. It received also $10,000 from J. W. Anderson and his wife for the erection of the new Anderson anatomic hall.

**Virginia.**—Citizens of Richmond subscribed $225,000 for the erection of a hospital for colored patients, and Major James H. Dooley gave $40,000 to build a hospital for contagious diseases. The buildings now under construction are to be a part of the Memorial Hospital, the teaching hospital of the Medical College of Virginia.

——A new wing to the University of Virginia Hospital has been opened. Besides additional beds, it contains the laboratory of clinical diagnosis, new quarters for the outpatient department and additional rooms for special medical and surgical service.

**Wisconsin.**—Marquette University School of Medicine has been offered one third of a million dollars by the Carnegie Foundation for the Advancement of Teaching, on condition that the university raise the other two thirds of a million within a year. The fund is to be used in the development of the School of Medicine.

### Scholarships and Fellowships in Medical Schools

Harvard University Medical School, in cooperation with the Boston Dispensary, offers a fellowship to graduates in medicine who desire to pursue a course of study leading to the certificate of public health in the school for health officers, or to the degree of Doctor of Public Health in the department of preventive medicine and hygiene. Fellows are required to give half their time to the treatment and supervision of the sick in their homes, in a district of the city of Boston, and half their time to study or research at the medical school. The stipend is $750 a year, and appointments are for one or two years.

At the University of Minnesota Medical School, fellowships in ophthalmology and otolaryngology have been established by Dr. Frank C. Todd and Dr. Frank E. Burch. They provide a stipend of $500 the first year, $750 the second year and $1,000 the third year. Such fellows are to spend half their time in the private clinic of Dr. Todd or Dr. Burch, and the other half in laboratory and clinical work and in pursuit of certain courses for specialists in ophthalmology and otolaryngology at the university. For work done in these private clinics, credit will be given toward the degree granted by the university in the course in ophthalmology and otolaryngology given to accepted doctors of medicine, covering a period of three years.

In the College of Physicians and Surgeons of Columbia University, under the special George Blumenthal scholarship of $900, distinct additions have been made to the clinical knowledge of diabetes. Three undergraduate scholarships have also been established during the last two years, and a fourth will be added during this year. The students who receive these scholarships work as special assistants in the laboratory and are used as assistants in laboratory teaching.

### Funds for Research

The University of California Medical School has received gifts amounting to $700 for scientific research in the department of biochemistry.

The Hunterian Laboratory of the Johns Hopkins University Medical Department, made possible through the munificence of the Rockefeller Foundation, has been completed. The building cost about $115,000 and the scientific equipment many thousands more. This laboratory will be used by men engaged in research work. It is connected by tunnels with the medical school and the physiologic building. It contains the medical library, the department of art as applied to medicine, the Carnegie Embryological Institute, a department for clinical medicine and children's diseases, and the pathologic department.

Washington University Medical School has received $1,000,000 from the General Education Board to finance research in surgery, medicine and pediatrics.

The Vanderbilt Clinic of the College of Physicians and Surgeons of Columbia University received $10,000 from the East River Homes Foundation of New York for tuberculosis work. The college also received $5,000 from Clarence H. Mackay to be added to the fund for surgical research, and $2,500 from Mrs. Frederick S. Coolidge for maintenance of the Coolidge Research Fellowship in Medicine.

## EDUCATION PRELIMINARY TO THE STUDY OF MEDICINE

PRELIMINARY REPORT OF A SPECIAL COMMITTEE[1] OF THE COUNCIL ON MEDICAL EDUCATION, THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES AND THE ASSOCIATION OF AMERICAN UNIVERSITIES, APPOINTED FEB. 5, 1917

### I. High School Requirements

(*a*) For admission to the two-year premedical college course, students shall have completed a four-year course of at least fourteen (fifteen after Jan. 1, 1920) units in a standard accredited high school or other institution of standard secondary school grade, or have its equivalent as demonstrated by examinations conducted by the College Entrance Examination Board, or by the authorized examiner of a standard college or university which has been approved by the Council on Medical Education. Unless all the entrance units are obtained by examination, a detailed statement of attendance at the secondary school, and a transcript of the student's work should be kept on file by the college authorities. This evidence of actual attendance at the secondary schools should be obtained no matter whether the student is admitted to the freshman or to higher classes.

(*b*) The subjects for which credits for admission to the Premedical College Course may be granted are shown in the following schedule:

SCHEDULE OF SUBJECTS REQUIRED OR ACCEPTED FOR ENTRANCE TO THE PREMEDICAL COLLEGE COURSE

| Subjects | Units | Required |
|---|---|---|
| English literature and composition | 3-4 | 3 |
| Latin | 1-4 | .. |
| Greek | 1-3 | .. |
| French or German | 1-4 | 2* |
| Other foreign languages | 2 | .. |
| Mathematics | | |
| Elementary algebra | 1 | 1 |
| Advanced algebra | ½-1 | .. |
| Plane geometry | 1 | 1 |
| Solid geometry | ½ | .. |
| Trigonometry | ½ | .. |
| History (one unit required) | | |
| Ancient history | 1 | |
| Medieval and modern history | 1 | |
| English history | ½-1 | 1 |
| American history | ½-1 | |
| Civil government | ½-1 | |
| Science | | |
| Botany | ½-1 | .. |
| Zoology | ½-1 | .. |
| Chemistry | 1 | .. |
| Physics | 1 | .. |
| Physiography | ½-1 | .. |
| Physiology | ½-1 | .. |
| Astronomy | ½ | .. |
| Geology | ½-1 | .. |
| Agriculture | 1-2 | .. |
| Bookkeeping | 1 | .. |
| Business law | ½ | .. |
| Commercial geography | ½-1 | .. |
| Domestic science | 1-2 | .. |
| Drawing, freehand and mechanical | ½-2 | .. |
| Economics and economic history | ½-1 | .. |
| Manual training | 1-2 | .. |
| Music: Appreciation or harmony | 1-2 | .. |

A unit is the credit value of at least 36 weeks' work of four or five recitation periods per week, each recitation period to be of not less than 40 minutes. In other words, a unit represents a year's study in any subject in a secondary school constituting approximately a quarter of a full year's work. A satisfactory year's work in any subject cannot be accomplished under ordinary circumstances in less than 120 sixty-minute hours, or their equivalent.

Of the 15 units of high school work *it is suggested* that 8 units be required, as indicated in the above schedule, and that other work to the amount of at least 7 units may be made up from any of the other subjects of the above schedule.

* A reading knowledge of French or German is required and should be obtained either in the high school or in college.

### II. Premedical College Course

(*c*) Beginning Jan. 1, 1918, the minimum requirement for admission to acceptable medical schools, in addition to the high school work specified above, will be sixty semester hours of collegiate work, extending through two years, of thirty-two weeks each, exclusive of holidays, in a college of liberal arts and sciences approved by the Council on Medical Education. The subjects included in the two years of college work should be in accordance with the following schedule:

SCHEDULE OF SUBJECTS OF THE TWO-YEAR PREMEDICAL COLLEGE COURSE

Sixty Semester Hours Required

| | Semester Hrs. |
|---|---|
| Required Courses: | |
| Chemistry (a) | 12 |
| Physics (b) | 8 |
| Biology (c) | 8 |
| English Composition and Literature (d) | 6 |
| French or German (e) | 6-12 |
| Courses Strongly Urged: | |
| Advanced Algebra, Solid Geometry and Trigonometry | 3- 6 |
| Additional courses in Chemistry | 3- 6 |
| An additional Modern Language—French or German (e) | 6-12 |
| Psychology | 3- 6 |
| Advanced Zoology, Embryology or Comparative Anatomy | 3- 6 |
| Suggested Elective Courses: | |
| English (additional), Economics, History, Sociology, Political Science, Logic, Mathematics, Latin, Greek, Drawing. | |

SUGGESTIONS REGARDING INDIVIDUAL SUBJECTS

(*a*) *Chemistry.* Twelve semester hours required, of which six must consist of laboratory work. Of the twelve, at least eight semester hours must be in general inorganic chemistry, of which four semester hours must consist of laboratory work. The remaining hours may consist of work in analytic or organic chemistry. When more than two years are spent in college, courses in organic, analytic or physical chemistry may be taken to advantage. Chemistry is probably the most important science fundamental to medicine.

(*b*) *Physics.* Eight semester hours required, of which at least two must be laboratory work. It is urged that this course be preceded by courses in advanced algebra, solid geometry and trigonometry.

(*c*) *Biology.* Eight semester hours required, of which four must consist of laboratory work. This requirement may be satisfied by an eight semester hour course in either general biology or zoology, or by four semester hour courses each in zoology and botany.

(*d*) *English Composition and Literature.* The usual six semester hour introductory college course, or its equivalent, is required.

(*e*) *French or German.* A reading knowledge of one of these languages is required, and the requirement may be absolved by demonstration on examination, written or oral, of the ability to read fluently medical French or German. When the requirement is absolved by college work, the student must complete the six semester hour course following either the two semester beginner's college course, or the completion of two entrance units of high school work in the language. When the requirement is absolved by an examination, such examination shall be a standard examination covering a course of at least six semester hours. If credit for such language has been counted toward the required fifteen units of secondary school work, no credit is to be given therefor, in the total sixty semester hours of required college work. If the reading knowledge in one of these languages is obtained on the basis of high school work, the student is urged to take the other language in his college course. It is not considered advisable, however, to spend more than twelve of the required sixty semester hours on foreign language. In case a reading knowledge of one language is obtained by six semester hours of college work, another six semester hours may be well spent in taking the beginner's course in the other language; if this is followed up by systematic reading of scientific prose, a reading knowledge of the second language may be readily acquired. When a student spends more than two years in college he may well spend twelve semester hours of his college work in the second language.

1. The Committee consists of Dr. Kendric C. Babcock, Dean of the College of Liberal Arts and Sciences of the University of Illinois, Urbana; Professor George Gailey Chambers, Director of Admissions of the University of Pennsylvania, Philadelphia; Dr. W. F. R. Phillips, Professor of Anatomy of the Medical College of the State of South Carolina; Dr. Theodore Hough, Dean of the University of Virginia Department of Medicine, and Dr. N. P. Colwell, Secretary of the Council on Medical Education of the American Medical Association.

## STANDARDS OF THE COUNCIL ON MEDICAL EDUCATION OF THE AMERICAN MEDICAL ASSOCIATION

### ESSENTIALS OF AN ACCEPTABLE MEDICAL COLLEGE

(Revised to Aug. 15, 1917)

**The following outline of the essentials of an acceptable medical college was issued by the Council on Medical Education of the American Medical Association for its suggestive value in the rapid development in progress in the medical colleges of the United States. It also represents the basis on which medical colleges are rated in the Council's classifications.**

ADMISSION OF STUDENTS

1. A strict enforcement of the foregoing[1] standards and requirements for admission, the college itself to be held responsible for any instances in which they are not enforced.

Note.—Since the product of the medical school depends largely on the quality of the students admitted, in rating medical colleges, special emphasis is laid by the Council on the strictness and honesty by which the standards of admission and advanced standing are administered. By the admission of unfit students the school is handicapped from the very beginning and, in the opinion of the Council, deserves a low rating regardless of its equipment, its clinical facilities and its teaching force.

ENTRANCE CONDITIONS UNTIL JAN. 1, 1918

2. A student may be admitted with certain subject conditions provided he has completed at least one year [thirty semester hours, see paragraph (*c*)] of work in an approved college of liberal arts or science, provided *no conditions may be permitted in the prescribed eight semester hours of college chemistry.* These conditions may be either in (1) or (2), but not in both: (1) In one half (four semester hours) of the required course in physics, or, (2) in one half of the required course in biology (four semester hours), or in zoology (three semester hours). These conditions must be removed before the beginning of the work of the second medical year, and the credits for these conditions must be in addition to the required thirty semester hours.

(*c*) A candidate who has completed two or more years of work in an approved college of liberal arts, or science, may be admitted conditioned in all of the required work in physics, or in one half of the physics and one half of the work required in biology, to a total not to exceed eight semester hours. These conditions must be removed before the beginning of the second medical year. No condition may be permitted in the prescribed eight semester hours of college chemistry.

After Jan. 1, 1918, the minimum requirement for admission to acceptable medical schools will be two years (sixty semester hours) of work in a college of arts and sciences[1] approved by the Council on Medical Education or its actual educational equivalent as demonstrated by an examination approved by the Council. It is suggested that in addition to the courses outlined in the preceding paragraph, this two year course include a course in organic chemistry, a second year of biology and more work in the modern language unless the student already possesses a reading knowledge of it.

APPROVED COLLEGES OF ARTS AND SCIENCES

3. (*a*) A list of colleges of arts and sciences approved by the Council on Medical Education is being prepared and will be published from time to time. By an approved college (of arts and sciences) is meant one whose standing has been vouched for by some standardizing agency in whose methods the Council has confidence. To be approved a college must have sufficient scientific equipment and maintain laboratories in the premedical sciences. It must have ample endowment to maintain a sufficient corps of teachers. Membership in some national organization or association of colleges will be favorably regarded by the Council and, in the absence of such membership, careful investigation will be made of the causes of exclusion.

MEDICAL SCHOOL REQUIREMENTS

4. The college should require that students be in actual attendance in the college *within the first week* of each annual session and thereafter.

5. Actual attendance at classes should be insisted on except for good cause, such as for sickness, and under no circumstances should credit be given for any course where the attendance has been less than 80 per cent. of the full time.

6. (*a*) Full advanced standing may be granted to students only for work done in other acceptable colleges, and in granting advanced standing there should be no discrimination against the college's full-course students. (*b*) In *exceptional cases* students from Class B medical schools may be given advanced standing but not higher than *entrance* to the third year (junior) class, and no credit should be given in any subject except on recommendation of the head of the department teaching that subject. (*c*) In *exceptional cases* students from Class C colleges may be given advanced standing but not higher than *entrance* to the second year (sophomore) class, and then only after thorough examinations in all first year subjects have been passed.

1. See report of special committee on "Education Preliminary to the Study of Medicine."

SUPERVISION, EQUIPMENT, TEACHERS

7. There should be careful and intelligent supervision of the entire school by a dean or other executive officer who holds, and has sufficient authority to carry out, fair ideals of medical education as determined by modern knowledge.

8. There should be a good system of records showing conveniently and in detail the credentials, attendance, grades and accounts of the students by means of which an exact knowledge can be obtained regarding each student's work. Records should also be kept showing readily the attendance of patients at the teaching hospitals and dispensaries; the maternity cases attended by students, and the postmortem cases used in teaching.

9. The college should have a fully graded course covering four years of at least thirty-two weeks each, exclusive of time required for matriculation and holidays, and at least thirty hours per week of actual work; this course should be clearly set forth in a carefully prepared and printed schedule of lectures and classes.

(*a*) The college should give two years of work consisting largely of laboratory work in thoroughly equipped laboratories in anatomy, histology, embryology, physiology, chemistry (inorganic, organic and physiologic), bacteriology, pathology, pharmacology, therapeutics and clinical diagnosis. Present-day medical knowledge makes it essential that these subjects be in charge of full-time, well-trained teachers.

(*b*) Two years of clinical work largely in hospitals and dispensaries, with thorough courses in internal medicine (including physical diagnosis, pediatrics, nervous and mental diseases), surgery (including surgical anatomy and operative surgery on the cadaver), obstetrics, gynecology, laryngology, rhinology, ophthalmology, otology, dermatology, hygiene and medical jurisprudence.

(*c*) As soon as conditions warrant, a fifth undergraduate year should be required which should be spent by the student as an intern in an approved hospital.

10. The college should provide at least *six expert, thoroughly trained professors* in the laboratory branches, salaried so that they may devote their entire time to instruction and to that research without which they cannot well keep up with the rapid progress being made in their subjects.[2] There should also be a sufficient number of assistants in each department to look after the less important details. For colleges having *sixty students or less* in each class, there should be *at least one full-time salaried assistant each in the departments* of (*a*) anatomy, (*b*) physiology, (*c*) pathology and bacteriology, and (*d*) physiologic chemistry and pharmacology, and *one additional assistant in each of these departments should be provided for each additional thirty students enrolled.* This represents a low average of the full-time assistants already employed by the acceptable medical colleges.

11. The faculty should be thoroughly organized and should be made up of graduates of institutions recognized as medical colleges and who have had a training in all departments of medicine. Nonmedical men should be selected as teachers in medical schools only under exceptional circumstances and only when medical men of equal special capacity are not available. Faculty members should be appointed because of their ability as teachers and not because they happen to be on the attending staff of a hospital or for other like reasons.

CLINICAL FACILITIES

12. The college should own or entirely control a hospital in order that students may come into close and extended contact with patients under the supervision of the attending staff. This hospital should be in close proximity to the college and have a daily average (for senior classes of 100 students *or less*) of not less than 200 patients who can be utilized for clinical teaching, these patients to be of such character as to permit the student to see and study the common variety of surgical and medical cases as well as a fair number in each of the so-called specialties. In the use of this material it is suggested that *bedside and ward clinics* be developed for sections of from five to ten students, and that a certain number of patients in medicine, surgery and the specialties be assigned to each senior student. A

2. These professors should have a definite responsibility in the conduct of the college, and their first and chief interest should be the training of medical students. It is advised that four of these professors be placed in charge of the departments of (*a*) anatomy, (*b*) physiology, (*c*) pathology and bacteriology and (*d*) physiologic chemistry and pharmacology. The other two may be assigned one to the laboratory course in histology and embryology under the department of anatomy and the other to the department of pathology and bacteriology, possibly to the course in laboratory clinical diagnosis.

well supervised clinical clerk system should also be installed. The treatment and care of these patients should be particularly observed and recorded by the student under the strict supervision of the intern, or the attending staff of the hospital.[3]

13. The college should also have ample hospital facilities for children's diseases, contagious diseases and nervous and mental diseases.

14. At least six maternity cases should be provided for each senior student, who should have actual charge of these cases under the supervision of the attending physician. Careful records of each case should be handed in by the student.

15. Facilities should be provided for at least thirty necropsies (for senior classes of 100 students *or less*) during each college session which are attended and participated in by senior students.

16. The college should own or control a dispensary, or outpatient department, the attendance to be a daily average of 100 patients (visits) (for senior classes of 100 students *or less*), the patients to be carefully classified, good histories and records of the patients to be kept and the material to be well used. The attending staff should be made up of good teachers, should be well organized and be regular in attendance.

OTHER TEACHING FACILITIES AND FINANCES

17. The college should have a working medical library to include the more modern text and reference books with the *Index Medicus* and thirty or more leading medical periodicals; the library room should be properly lighted and heated, and easily accessible to students during all or the greater part of the day; it should be equipped with suitable tables and chairs, and have a librarian in charge.

18. A working medical museum having its various anatomic, embryologic, pathologic and other specimens carefully prepared, labeled and indexed so that any specimen may be easily found and employed for teaching purposes. It is suggested that so far as possible with each pathologic specimen coming from postmortems there also be kept the record of the postmortem, the clinical history of the patient on whom the necropsy was held and microscopic slides showing the minute structures of the disease shown in the gross specimen.

19. There should be sufficient dissecting material to enable each student individually to dissect at least the lateral half of the human cadaver; to provide cross-sections and other demonstration material and to allow of a thorough course for each senior in operative surgery on the cadaver.

20. For modern experimental laboratory work in physiology, pharmacology and bacteriology as well as for a reasonable amount of medical research, a supply of animals—frogs, turtles, rabbits and guinea-pigs, if not also cats and dogs—is essential. Proper provision, also, is necessary for the housing and care of such animals. In any use made of animals great care should be used to prevent needless suffering, and work by students should be carefully supervised.

21. A supply of such useful auxiliary apparatus as a stereopticon, a reflectoscope, carefully prepared charts, embryologic or other models, manikins, dummies for use in bandaging, a Roentgen ray and other apparatus now so generally used in medical teaching.

22. The college should show evidences of thorough organization and of reasonably modern methods in all departments and evidences that the equipment and facilities are *being intelligently used* in the training of medical students.

23. A clear statement of the college's requirements for admission, tuition, time of attendance on the classes, sessions, courses offered and graduation should be clearly set forth, together with complete classified lists of its matriculants and latest graduating class in regular annual catalogues or announcements.

24. Statistics show[4] that modern medicine cannot be acceptably taught by a medical school depending solely on the income from students' fees. No medical school should expect to be retained in Class A, therefore, which does not have an annual income of at least $25,000 in addition to the amount obtained from students' fees.

*NOTE.—Correspondence from medical colleges regarding the above requirements is invited, and further suggestions or information available will be gladly furnished.*

3. Suggestions more in detail may be found in the "Report of the Committee on the Reorganization of Clinical Teaching," THE JOURNAL A. M. A., March 6, 1915. Reprint sent on application.
4. See Medical College Finances, THE JOURNAL A. M. A., April 8, 1916, p. 1115.

### Grading of Medical Colleges

All medical colleges are rated by the Council on Medical Education on a civil service basis on a scale of 1,000 points. The data relating to each college are grouped under ten general heads in such manner that the groups have as nearly equal weight as possible, each group allowing a possible 100 points (10 per cent.) out of a possible 1,000 points (100 per cent.). The ten heads under which the data are arranged are as follows:

1. Showing of graduates before state boards and other evidences of the training received.
2. Enforcement of a satisfactory preliminary educational requirement, granting of advanced standing and the character of the records.
3. Character of curriculum, grading of course, length of session, time allowed for matriculation and supervision.
4. Medical school buildings; light, heat, ventilation, cleanliness.
5. Laboratory facilities and instruction.
6. Dispensary facilities and instruction.
7. Hospital facilities and instruction, maternity work, necropsies, specialties.
8. Faculty, number and qualifications of trained teachers, full-time instructors, and assistants, especially of the laboratory branches, organization, and extent of research work.
9. Extent to which the school is conducted for properly teaching the science of medicine rather than for the profit of the faculty directly or indirectly.
10. Possession and use made of libraries, museums, charts, stereopticons, etc.

Class A colleges are those which are acceptable; Class B, those which, under their present organization, might be made acceptable by general improvements, and Class C, those which require a complete reorganization to make them acceptable.

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## CLASSIFICATION OF MEDICAL COLLEGES

Revised to June 7, 1917

### CLASS A—ACCEPTABLE MEDICAL COLLEGES

ALABAMA

University of Alabama School of Medicine.....Mobile

CALIFORNIA

Leland Stanford Junior Univ. School of Med..San Francisco
University of California Medical School.....San Francisco

COLORADO

University of Colorado School of Med.....Boulder-Denver

CONNECTICUT

Yale University School of Medicine.....New Haven

DISTRICT OF COLUMBIA

Georgetown University School of Medicine.....Washington
George Washington University Medical School..Washington
Howard University School of Medicine[1].....Washington

GEORGIA

Emory University School of Medicine[2].....Atlanta
University of Georgia Medical Department[3].....Augusta

ILLINOIS

Northwestern University Medical School.....Chicago
Rush Medical College (University of Chicago).....Chicago
University of Illinois College of Medicine.....Chicago

INDIANA

Indiana Univ. School of Med.....Bloomington-Indianapolis

IOWA

State University of Iowa College of Medicine....Iowa City
State Univ. of Iowa Coll. of Homeopathic Med....Iowa City

KANSAS

University of Kansas School of Med....Lawrence-Rosedale

KENTUCKY

University of Louisville Medical Department[4].....Louisville

LOUISIANA

Tulane Univ. of Louisiana School of Med....New Orleans

MAINE

Bowdoin Medical School.....Brunswick-Portland

MARYLAND

Johns Hopkins University Medical Department....Baltimore
University of Maryland School of Medicine and
the College of Physicians and Surgeons.....Baltimore

1. Rating raised to Class A June 6, 1910.
2. Rating raised to Class A Feb. 24, 1914; formerly the Atlanta Medical College.
3. Class A rating restored Feb. 24, 1913.
4. Rating raised to Class A June 6, 1910.

MASSACHUSETTS

Boston University School of Medicine.....Boston
Medical School of Harvard University.....Boston
Tufts College Medical School.....Boston

MICHIGAN

Detroit College of Medicine and Surgery[5].....Detroit
University of Michigan Medical School.....Ann Arbor
University of Mich. Homeopathic Med. School....Ann Arbor

MINNESOTA

University of Minnesota Medical School.....Minneapolis

MISSISSIPPI

University of Mississippi School of Medicine*.....Oxford

MISSOURI

St. Louis University School of Medicine.....St. Louis
University of Missouri School of Medicine*.....Columbia
Washington University Medical School.....St. Louis

NEBRASKA

John A. Creighton Medical College[6].....Omaha
University of Nebraska College of Medicine.....Omaha

NEW HAMPSHIRE

Dartmouth Medical School*.....Hanover

NEW YORK

Albany Medical College.....Albany
Columbia Univ. Coll. of Phys. and Surgs....New York City
Cornell University Medical College.....New York City
Fordham University School of Medicine[7].....New York City
Long Island College Hospital[8].....Brooklyn
Syracuse University College of Medicine.....Syracuse
University and Bellevue Hospital Med. Coll..New York City
University of Buffalo Department of Medicine.....Buffalo

NORTH CAROLINA

University of North Carolina School of Med.* Chapel Hill
Wake Forest College School of Medicine*....Wake Forest

NORTH DAKOTA

University of North Dakota School of Medicine*..University

OHIO

Ohio State University College of Medicine.....Columbus
University of Cincinnati College of Medicine.....Cincinnati
Western Reserve University School of Medicine..Cleveland

OREGON

University of Oregon Medical School.....Portland

PENNSYLVANIA

Hahnemann Medical College and Hospital.....Philadelphia
Jefferson Medical College of Philadelphia.....Philadelphia
University of Pennsylvania School of Med....Philadelphia
University of Pittsburgh School of Medicine[9].....Pittsburgh
Woman's Medical College of Pennsylvania.....Philadelphia

SOUTH CAROLINA

Medical College of the State of South Carolina[10]..Charleston

SOUTH DAKOTA

University of South Dakota College of Medicine*..Vermilion

TENNESSEE

University of Tennessee College of Medicine[11].....Memphis
Vanderbilt University Medical Department.....Nashville

TEXAS

Baylor University College of Medicine[12].....Dallas
University of Texas Department of Medicine.....Galveston

UTAH

University of Utah School of Medicine*.....Salt Lake City

VERMONT

University of Vermont College of Medicine.....Burlington

VIRGINIA

Medical College of Virginia.....Richmond
University of Virginia Department of Med....Charlottesville

* Gives only the first two years of the medical course.
5. Class A rating restored June 21, 1914.
6. Class A rating restored Feb. 4, 1917.
7. Class A rating restored Feb. 24, 1914.
8. Class A rating restored June 21, 1914.
9. Rating raised to Class A June 6, 1910.
10. Class A rating restored Feb. 6, 1916.
11. Rating raised to Class A June 21, 1914.
12. Rating raised to Class A June 12, 1916.

WEST VIRGINIA

West Virginia Univ. School of Medicine*[13].....Morgantown

WISCONSIN

Marquette University School of Medicine[14].....Milwaukee
University of Wisconsin Medical School*.....Madison

Total, 69.

## CLASS B—COLLEGES NEEDING GENERAL IMPROVEMENTS TO BE MADE ACCEPTABLE

ARKANSAS

University of Arkansas Medical Department.....Little Rock

CALIFORNIA

Oakland College of Medicine and Surgery[15].. .....Oakland
University of Southern California Medical Department (College of Physicians and Surgeons).....Los Angeles

ILLINOIS

Chicago College of Medicine and Surgery.....Chicago
Hahnemann Medical College and Hospital[16].....Chicago
Loyola University School of Medicine[17].....Chicago

NEW YORK

New York Homeopathic Medical College and Flower Hospital[18].....New York City

NORTH CAROLINA

Leonard Medical School*[19].....Raleigh

OHIO

Eclectic Medical College.....Cincinnati
Ohio State Univ. Coll. of Homeopathic Med.[20].....Columbus

OKLAHOMA

Univ. of Oklahoma School of Med.[21]..Norman-Oklahoma City

PENNSYLVANIA

Temple University Department of Medicine[22]....Philadelphia

TENNESSEE

Meharry Medical College[23].....Nashville

TEXAS

Fort Worth School of Medicine[24].....Fort Worth

Total, 14.

## CLASS C—COLLEGES REQUIRING A COMPLETE REORGANIZATION TO MAKE THEM ACCEPTABLE

CALIFORNIA

College of Medical Evangelists....Loma Linda-Los Angeles
College of Physicians and Surgeons.....San Francisco

ILLINOIS

Chicago Hospital College of Medicine.....Chicago
Jenner Medical College[25].....Chicago

MASSACHUSETTS

College of Physicians and Surgeons.....Boston

MISSOURI

Eclectic Medical University[26].....Kansas City
National Univ. of Arts and Sciences Med. Dept.[27]...St. Louis

NEBRASKA

Lincoln Medical College[28].....Lincoln

* Give only the first two years of the medical course.
13. Class A rating restored Feb. 4, 1917.
14. Rating raised to Class A Feb. 15, 1915.
15. Rating dropped to Class B June 6, 1910.
16. Rating dropped to Class B June 3, 1912.
17. Heretofore known as Bennett Medical College.
18. Rating dropped to Class B Feb. 15, 1915.
19. Rating raised to Class B June 21, 1914.
20. Rating raised to Class B Feb. 4, 1917.
21. Rating dropped to Class B June 3, 1912.
22. Rating raised to Class B June 6, 1910.
23. Rating dropped to Class B Feb. 24, 1914.
24. Rating changed to Class B May 10, 1914.
25. Rated in Class C when last inspected—1912. Has recently refused reinspection. Data otherwise obtained do not indicate that a higher rating is warranted.
26. An offshoot of this institution—the Kansas City College of Medicine and Surgery—was organized in 1915. It is reported not recognized by the Missouri State Board of Health. Since it is an offshoot of a Class C institution reported not recognized by the Missouri State Board of Health, no higher rating could be granted it pending an inspection.
27. Formerly known as the American Medical College.
28. Formerly known as the Cotner University Medical College.

NEW YORK

New York Med. Coll. and Hosp. for Women[29] . . . New York City

TENNESSEE

University of West Tenn. Coll. of Med. and Surg. . . Memphis

Total 10.

## CLASSIFICATION OF CANADIAN MEDICAL COLLEGES

### CLASS A

University of Toronto Faculty of Medicine . . . . Toronto, Ont.
McGill University Faculty of Medicine . . . . . Montreal, Que.

### CLASS B

University of Manitoba, Manitoba Medical College[30] . . . . . Winnipeg, Ont.
Dalhousie University Faculty of Medicine . . . . . Halifax, N. S.
Western University Faculty of Medicine[31] . . . . . London, Ont.
Montreal School of Medicine and Surgery . . . . Montreal, Que.
Laval University Faculty of Medicine . . . . . Quebec, Que.

### CLASS C

Queen's University Faculty of Medicine[32] . . . . . Kingston, Ont.

The University of Alberta at Edmonton, besides the premedical year, gives only the first two years of the medical course as measured by that of the medical schools of the United States. It has not been inspected.

### Colleges Not Recognized

Official statement from the following thirty-six state licensing boards indicate that as a rule the colleges rated in Class C are not recognized:

| | | |
|---|---|---|
| Alabama | Maine | Ohio |
| Arkansas (Reg.) | Maryland (Reg.) | Oklahoma |
| Colorado | Michigan | Pennsylvania |
| Connecticut (Reg.) | Minnesota | Porto Rico |
| Delaware | Mississippi | Rhode Island |
| Florida (Reg.) | Montana* | South Carolina |
| Georgia | New Hampshire | South Dakota |
| Indiana | New Jersey | Texas |
| Iowa | New Mexico | Vermont |
| Kansas | New York | Virginia |
| Kentucky | North Carolina | West Virginia |
| Louisiana (Reg.) | North Dakota | Wisconsin |

The licensing boards of Montana, New Hampshire, Rhode Island and Virginia report that they recognize only the medical colleges listed in Class A.

### Colleges Having Higher Entrance Requirements

The fifty-three medical schools* which are now requiring, as a minimum for entrance, *two years* or more of work in a college of liberal arts in addition to a four-year high-school education, the year when the higher requirement became effective and the rating of each college, are as follows:

| | In Effect | College Rating |
|---|---|---|
| **ALABAMA** | | |
| University of Alabama School of Medicine | 1915 | A |
| **CALIFORNIA** | | |
| College of Medical Evangelists | 1915 | C |
| University of Southern California Medical Department (College of Physicians and Surgeons) | 1916 | B |
| Leland Stanford Junior University School of Medicine | 1909 | A |
| University of California Medical School | 1905 | A |
| **COLORADO** | | |
| University of Colorado School of Medicine | 1910 | A |
| **CONNECTICUT** | | |
| Yale University School of Medicine | 1909 | A |
| **DISTRICT OF COLUMBIA** | | |
| Georgetown University School of Medicine | 1912 | A |
| Howard University School of Medicine | 1914 | A |
| **ILLINOIS** | | |
| Hahnemann Medical College and Hospital | 1916 | B |
| Northwestern University Medical School | 1911 | A |
| Rush Medical College (University of Chicago) | 1904 | A |
| University of Illinois College of Medicine | 1914 | A |
| **INDIANA** | | |
| Indiana University School of Medicine | 1910 | A |
| **IOWA** | | |
| State University of Iowa College of Medicine | 1910 | A |
| State University of Iowa College of Homeopathic Medicine | 1910 | A |
| **KANSAS** | | |
| University of Kansas School of Medicine | 1909 | A |
| **MAINE** | | |
| Bowdoin Medical School | 1916 | A |
| **MARYLAND** | | |
| Johns Hopkins University Medical Department | 1893 | A |
| **MASSACHUSETTS** | | |
| Boston University School of Medicine | 1916 | A |
| Medical School of Harvard University | 1900 | A |
| **MICHIGAN** | | |
| University of Michigan Medical School | 1909 | A |
| University of Michigan Homeopathic Medical School | 1916 | A |
| **MINNESOTA** | | |
| University of Minnesota Medical School | 1907 | A |
| **MISSOURI** | | |
| University of Missouri School of Medicine | 1910 | A |
| Washington University Medical School | 1912 | A |
| **NEBRASKA** | | |
| University of Nebraska College of Medicine | 1909 | A |
| **NEW HAMPSHIRE** | | |
| Dartmouth Medical School | 1910 | A |
| **NEW YORK** | | |
| Columbia University College of Physicians and Surgeons | 1910 | A |
| Cornell University Medical College | 1908 | A |
| Syracuse University College of Medicine | 1910 | A |
| **NORTH CAROLINA** | | |
| Leonard Medical School | 1914 | B |
| Wake Forest College School of Medicine | 1908 | A |
| University of North Carolina School of Medicine | 1917 | A |
| **NORTH DAKOTA** | | |
| University of North Dakota School of Medicine | 1907 | A |
| **OHIO** | | |
| Ohio State University College of Medicine | 1915 | A |
| Ohio State Univ. College of Homeopathic Medicine | 1916 | C |
| University of Cincinnati College of Medicine | 1913 | A |
| Western Reserve University School of Medicine | 1901 | A |
| **OKLAHOMA** | | |
| University of Oklahoma School of Medicine | 1917 | B |
| **OREGON** | | |
| University of Oregon Department of Medicine | 1915 | A |
| **PENNSYLVANIA** | | |
| Hahnemann Medical College and Hospital | 1917 | A |
| Jefferson Medical College | 1917 | A |
| University of Pennsylvania School of Medicine | 1910 | A |
| University of Pittsburgh School of Medicine | 1913 | A |
| Woman's Medical College of Pennsylvania | 1915 | A |
| **SOUTH CAROLINA** | | |
| Medical College of the State of South Carolina | 1916 | A |
| **SOUTH DAKOTA** | | |
| University of South Dakota College of Medicine | 1909 | A |
| **TEXAS** | | |
| University of Texas Department of Medicine | 1917 | A |
| **UTAH** | | |
| University of Utah School of Medicine | 1910 | A |
| **VIRGINIA** | | |
| Medical College of Virginia | 1915 | A |
| University of Virginia Department of Medicine | 1917 | A |
| **WEST VIRGINIA** | | |
| West Virginia University School of Medicine | 1917 | A |
| **WISCONSIN** | | |
| Marquette University School of Medicine | 1915 | A |
| University of Wisconsin Medical School | 1907 | A |

29. Rating dropped to Class C June 3, 1912.
30. Rating dropped to Class B Feb. 6, 1916.
31. Rating raised to Class B Feb. 4, 1917.
32. Rating dropped to Class C Feb. 6, 1916.

* Colleges will be omitted from this list unless evidence obtained shows that, in the admission of students, they are requiring at least sixty semester hours of preliminary collegiate work in addition to a four-year high school education.

The thirty following medical colleges† which are now requiring, as a minimum for entrance, one year of collegiate work in addition to a four-year high school course, the years when the requirements began and the rating of the colleges are:

| | In Effect | College Rating |
|---|---|---|
| **ARKANSAS** | | |
| University of Arkansas Medical Department | 1915 | B |
| **CALIFORNIA** | | |
| Oakland College of Medicine and Surgery | 1915 | B |
| **DISTRICT OF COLUMBIA** | | |
| George Washington University Medical School | 1914 | A |
| **GEORGIA** | | |
| Emory University School of Medicine, Atlanta | 1914 | A |
| University of Georgia Medical Department | 1914 | A |
| **ILLINOIS** | | |
| Loyola University School of Medicine | 1915 | B |
| Chicago College of Medicine and Surgery | 1915 | B |
| **KENTUCKY** | | |
| University of Louisville Medical Department | 1914 | A |
| **LOUISIANA** | | |
| Tulane University of Louisiana School of Medicine | 1910 | A |

† Colleges will be omitted from this list unless evidence obtained shows that, in the admission of students, they are requiring at least thirty semester hours of preliminary collegiate work, in addition to a four-year high school education.

| | | |
|---|---|---|
| **MARYLAND** | | |
| University of Maryland School of Medicine and College of Physicians and Surgeons | 1914 | A |
| **MASSACHUSETTS** | | |
| Tufts College Medical School | 1914 | A |
| **MICHIGAN** | | |
| Detroit College of Medicine and Surgery | 1914 | A |
| **MISSISSIPPI** | | |
| University of Mississippi School of Medicine | 1914 | A |
| **MISSOURI** | | |
| St. Louis University School of Medicine | 1910 | A |
| **NEBRASKA** | | |
| John A. Creighton Medical College | 1914 | A |
| **NEW YORK** | | |
| Albany Medical College | 1914 | A |
| Fordham University School of Medicine | 1911 | A |
| Long Island College Hospital | 1914 | A |
| New York Homeopathic Medical College and Flower Hospital | 1915 | B |
| New York Medical College and Hospital for Women | 1916 | C |
| University and Bellevue Hospital Medical College | 1912 | A |
| University of Buffalo Department of Medicine | 1914 | A |
| **OHIO** | | |
| Eclectic Medical College | 1915 | B |
| **OKLAHOMA** | | |
| University of Oklahoma School of Medicine | 1914 | B |
| **PENNSYLVANIA** | | |
| Temple University Department of Medicine | 1914 | B |
| **TENNESSEE** | | |
| Vanderbilt University Medical Department | 1914 | A |
| University of Tennessee College of Medicine | 1914 | A |
| **TEXAS** | | |
| Baylor University College of Medicine | 1913 | A |
| Fort Worth School of Medicine | 1916 | B |
| **VERMONT** | | |
| University of Vermont College of Medicine | 1912 | A |

The eleven following medical colleges either have not announced the higher entrance requirements or evidence has not been received to show they are in effect for all students enrolled:

| | Rating |
|---|---|
| College of Physicians and Surgeons, San Francisco | C |
| Chicago Hospital College of Medicine | C |
| Jenner Medical College, Chicago | C |
| College of Physicians and Surgeons, Boston | C |
| Middlesex College of Medicine and Surgery, Cambridge, Mass. | * |
| Eclectic Medical University, Kansas City | C |
| Kansas City College of Medicine and Surgery | * |
| National University of Arts and Sciences, St. Louis | C |
| St. Louis College of Physicians and Surgeons | C |
| Lincoln Medical College, Lincoln, Neb. | C |
| University of West Tenn. College of Med. and Surg., Memphis | C |

* This college has not been inspected.

## State University Medical Schools

Twenty-nine states now have medical schools as integral parts of the state universities or—in one instance—under state control as a separate institution. These states and other interesting data regarding the medical schools are as follows:

STATE UNIVERSITY MEDICAL SCHOOLS

| Medical School of State University of | Only School in State | Length of Med. Course in Years | Years of College Work for Admission | Medical School of State University of | Only School in State | Length of Med. Course in Years | Years of College Work for Admission |
|---|---|---|---|---|---|---|---|
| Alabama | Yes | 4 | 2† | North Carolina | .... | 2 | 2 |
| Arkansas | Yes | 4 | 2† | North Dakota | Yes | 2 | 2† |
| California | .... | 5 | 2 | Ohio* | .... | 4 | 2 |
| Colorado | Yes | 4 | 2† | Oklahoma | Yes | 4 | 2† |
| Georgia | .... | 4 | 2 | Oregon | Yes | 4 | 2 |
| Illinois | .... | 4 | 2 | South Carolina | Yes | 4 | 2† |
| Indiana | Yes | 4 | 2† | South Dakota | Yes | 2 | 2† |
| Iowa* | Yes | 4 | 2† | Tennessee | .... | 4 | 2 |
| Kansas | Yes | 4 | 2† | Texas | .... | 4 | 2 |
| Maryland | .... | 4 | 2† | Utah | Yes | 2 | 2 |
| Michigan* | .... | 4 | 2† | Vermont | Yes | 5 | 2 |
| Minnesota | Yes | 5 | 2† | Virginia | .... | 4 | 2† |
| Mississippi | Yes | 2 | 2 | West Virginia | Yes | 2 | 2 |
| Missouri | .... | 2 | 2 | Wisconsin | .... | 2 | 2† |
| Nebraska | .... | 4 | 2 | | | | |

* Have homeopathic departments.
† Similar requirements by licensing board.

In sixteen states no other medical schools exist, medical education in the state being entirely in charge of the state university.

An act of the Maryland legislature in 1914 created a Maryland State University and provided $15,000 per year for 1915 and 1916, to be used for medical education in the state. The University of Maryland School of Medicine and the College of Physicians and Surgeons of Baltimore is the medical school of the new university.

Of the twenty-nine state medical schools, twenty-one give the complete medical course and grant degrees, while eight give only the first two years of the medical course. California, Minnesota and Vermont require a five-year course, the fifth year to be spent by the student in a hospital as an intern, or in other recognized clinical work. The universities of Iowa, Michigan and Ohio have homeopathic departments.

All of these medical schools now require or have announced the requirement of two years of college work for admission. In fifteen states, the colleges have the support of their state licensing boards, which have adopted two years of college work as the minimum requirement of preliminary education. In some of the remaining states the licensing boards do not appear to be in sympathy with the higher requirement.

## State Requirements of Higher Preliminary Education

There are now thirty-seven states which have adopted requirements of preliminary education in addition to a standard four-year high school education. These states, the number of college years required and the time the higher requirements became or become effective are as follows:

| State Examining Board of | Number of Years Required | Affects Students Matriculating | Affects All Graduates |
|---|---|---|---|
| *Requiring Two Years: 25* | | | |
| Alabama | 2 | 1915-16 | 1919 |
| Alaska | 2 | 1918-19 | 1922 |
| Arizona | 2 | 1918-19 | 1922 |
| Arkansas | 2 | 1918-19 | 1922 |
| Colorado | 2 | 1910-11 | 1914 |
| Indiana | 2 | 1911-12 | 1915 |
| Iowa | 2 | 1911-12 | 1915 |
| Kansas | 2 | 1918-19 | 1922 |
| Louisiana | 2 | 1918-19 | 1922 |
| Maryland | 2 | 1918-19 | 1922 |
| Michigan | 2 | 1918-19 | 1922 |
| Minnesota | 2 | 1908-09 | 1912 |
| Montana | 2 | 1918-19 | 1922 |
| New Hampshire | 2 | 1915-16 | 1919 |
| New Jersey | 2 | 1917-18 | 1921 |
| New Mexico | 2 | 1918-19 | 1922 |
| New York | 2 | 1918-19 | 1922 |
| North Dakota | 2 | 1908-09 | 1912 |
| Oklahoma | 2 | 1917-18 | 1921 |
| Rhode Island | 2 | 1918-19 | 1922 |
| South Carolina | 2 | 1918-19 | 1922 |
| South Dakota | 2 | 1911-12 | 1915 |
| Virginia | 2 | 1917-18 | 1921 |
| Washington | 2 | 1918-19 | 1922 |
| Wisconsin | 2 | 1915-16 | 1919 |
| *Requiring One Year:* | | | |
| Alaska* | 1 | 1914-15 | 1918 |
| Arizona* | 1 | 1914-15 | 1918 |
| Arkansas* | 1 | 1915-16 | 1919 |
| California | 1 | 1915-16 | 1919 |
| Connecticut | 1 | 1910-11 | 1914 |
| Illinois | 1 | 1915-16 | 1919 |
| Indiana* | 1 | 1910-11 | 1914 |
| Kansas* | 1 | 1910-11 | 1914 |
| Kentucky | 1 | 1914-15 | 1918 |
| Louisiana* | 1 | 1915-16 | 1919 |
| Maryland* | 1 | 1914-15 | 1918 |
| Michigan* | 1 | 1914-15 | 1918 |
| Mississippi | 1 | 1915-16 | 1919 |
| New Hampshire* | 1 | 1914-15 | 1918 |
| New Jersey* | 1 | 1916-17 | 1920 |
| New York* | 1 | 1917-18 | 1921 |
| North Carolina | 1 | 1914-15 | 1918 |
| Oklahoma* | 1 | 1914-15 | 1918 |
| Pennsylvania | 1 | 1914-15 | 1918 |
| Rhode Island* | 1 | 1914-15 | 1918 |
| South Dakota* | 1 | 1908-09 | 1912 |
| Tennessee | 1 | 1915-16 | 1919 |
| Texas | 1 | 1914-15 | 1918 |
| Utah | 1 | 1913-14 | 1917 |
| Vermont | 1 | 1913-14 | 1917 |
| Virginia* | 1 | 1914-15 | 1918 |
| Washington* | 1 | 1914-15 | 1918 |
| West Virginia | 1 | 1917-18 | 1921 |

* The 2-year requirement became or becomes effective later.

### Hospital Intern Year

Six medical colleges have adopted the requirement of a fifth year to be spent by the student as an intern in an approved hospital or in other acceptable clinical work before the M.D. degree will be granted. These colleges and the sessions when the requirement became effective are as follows:

| | Session of |
|---|---|
| University of Minnesota Medical School | 1910-11 |
| Leland Stanford Jr. University School of Medicine | 1914-15 |
| Rush Medical College (University of Chicago) | 1914-15 |
| University of California Medical School | 1914-15 |
| Northwestern University Medical School | 1915-16 |
| University of Vermont College of Medicine | 1915-16 |

Six state licensing boards now require that every candidate to be eligible for license to practice medicine in those states must have served at least one year as an intern in an approved hospital. The requirement became effective in Pennsylvania in 1914, in New Jersey in 1916, and will become effective in North Dakota and Rhode Island in 1918, in Illinois in 1921 and in Michigan in 1922.

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## THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

The requirements for admission to and graduation from colleges holding membership in this association are 14 units of high school work and two years (60 semester hours) of college work.

### THE HIGH SCHOOL REQUIREMENT

(A) Required, 7 units

| | Units |
|---|---|
| Mathematics (minimum 2 years, maximum 3 years), algebra and plane geometry | 2 |
| English (minimum 2 years, maximum 4 years) | 2 |
| One foreign language (minimum 2 years, maximum 4 years) | 2 |
| History and civics | 1 |
| Total number of required units | 7 |

(B) Elective, 7 units.

To be selected from the following:

| | Units |
|---|---|
| English language and literature (in addition to the required work) | 1 to 2 |
| Foreign languages, additional, Latin, German, Italian, French, Spanish or Greek (not less than 1 year in any one) | 1 to 4 |
| Advanced mathematics, advanced algebra, solid geometry and trigometry (½ year each) | 1 |
| Natural science, chemistry 1 year, physics 1 year, and biology, botany, physiology and zoology (½ to 1 year each) | ½ to 2 |
| Earth science, physical geography, geology and agriculture (½ year to 1 year each) | ½ to 1 |
| Astronomy (½ year) | ½ |
| Drawing (½ to 1 year) | ½ to 1 |
| History, ancient, medieval and modern, and English (1 year each) | 1 to 3 |
| Economics (½ year) | ½ |
| Manual training (1 year) | 1 |
| Bookkeeping (½ to 1 year) | ½ to 1 |

One unit in any subject is the equivalent of work in that subject for four or five periods per week for a year of at least thirty-six weeks, periods to be not less than forty-five minutes in length. One unit is equivalent to 2 semester credits or 2 points.

### PREMEDICAL COLLEGE COURSE

(See Report of Special Committee on Education Preliminary to Study of Medicine, page 546.)

### MEDICAL CURRICULUM

DIVISION 1.—ANATOMY, 720 HOURS (18 per Cent.)

| | Hours. | Lect. Rec. Dem. | Lab. Wk. |
|---|---|---|---|
| (a) Gross anatomy (including applied anatomy) | 510 | 120 | 390 |
| (b) Histologic and microscopic anatomy | 135 | 30 | 105 |
| (c) Embryology | 75 | 30 | 45 |

DIVISION 2.—PHYSIOLOGY AND CHEMISTRY, 600 HOURS (15 per Cent.)

| | Hours. | Lect. Rec. Dem. | Lab. Wk. |
|---|---|---|---|
| (a) Inorganic chemistry | 180 | 60 | 120 |
| (b) Organic chemistry | 75 | 30 | 45 |
| (c) Physiologic chemistry | 104 | 30 | 75 |
| (d) Physiology | 240 | 140 | 100 |

DIVISION 3.—PATHOLOGY, BACTERIOLOGY AND HYGIENE, 450 HOURS (11.25 per Cent.)

| | Hours. | Lect. Rec. Dem. | Lab. Wk. |
|---|---|---|---|
| (a) Bacteriology | 135 | 30 | 105 |
| (b) Hygiene and general dietetics | 45 | 45 | ... |
| (c) Pathology | 270 | 60 | 210 |

DIVISION 4.—PHARMACOLOGY, MATERIA MEDICA AND THERAPEUTICS, 240 HOURS (6 per Cent.)

| | Hours. | Lect. Rec. Dem. | Lab. Wk. |
|---|---|---|---|
| (a) Pharmacology | 105 | 40 | 65 |
| (b) Materia medica and pharmacology | 80 | ... | ... |
| (c) Therapeutics | 55 | ... | ... |

DIVISION 5.—MEDICINE AND MEDICAL SPECIALTIES, 970 HOURS (24.25 per Cent.)

| | Hours. | Lect. Rec. Dem. | Lab. Wk. |
|---|---|---|---|
| (a) General medicine (including clinical microscopy) | 640 | ... | ... |
| (b) Pediatrics | 150 | ... | ... |
| (c) Nervous and mental diseases | 105 | ... | ... |
| (d) Jurisprudence, ethics and economics | 30 | ... | ... |
| (e) Dermatology and syphilis | 45 | ... | ... |

DIVISION 6.—SURGERY AND SURGICAL SPECIALTIES, 720 HOURS (18 per Cent.)

| | Hours. | Lect. Rec. Dem. | Lab. Wk. |
|---|---|---|---|
| (a) General surgery | 510 | ... | ... |
| (b) Orthopedic surgery | 45 | ... | ... |
| (c) Genito-urinary diseases | 45 | ... | ... |
| (d) Eye | 60 | ... | ... |
| (e) Ear, nose and throat | 60 | ... | ... |

DIVISION 7.—OBSTETRICS AND GYNECOLOGY, 300 HOURS (7.5 per Cent.)

| | Hours. | Lect. Rec. Dem. | Lab. Wk. |
|---|---|---|---|
| (a) Obstetrics | 195 | ... | ... |
| (b) Gynecology (including some abdominal surgery) | 105 | ... | ... |

Colleges may reduce the number of hours in any subject not more than 20 per cent. provided that the total number of hours in a division is not reduced. Where the teaching conditions in a college are best subserved, the subject may be, for teaching purposes, transferred from one division to another. When didactic and laboratory hours are specified in any subject, laboratory hours may be substituted for didactic hours.

(NOTE.—At the 1916 meeting the Committee on Education and Pedagogics was instructed to revise this curriculum to meet the present requirements.)

### MEMBERS OF ASSOCIATION

University of Alabama School of Medicine.
Leland Stanford Junior University School of Medicine.
University of California Medical School.
University of Southern California Medical Department.
University of Colorado School of Medicine.
Yale University School of Medicine.
Georgetown University School of Medicine.
George Washington University Medical School.
Howard University School of Medicine.
Emory University School of Medicine.
University of Georgia Medical Department.
Northwestern University Medical School.
Rush Medical College.
University of Illinois College of Medicine.
Indiana University School of Medicine.
State University of Iowa School of Medicine.
University of Kansas School of Medicine.
University of Louisville Medical Department.
Tulane University of Louisiana School of Medicine.
Johns Hopkins University Medical Department.
University of Maryland School of Medicine and College of Physicians and Surgeons.
Medical School of Harvard University.
Tufts College Medical School.
Detroit College of Medicine and Surgery.
University of Michigan Medical School.
University of Minnesota Medical School.
University of Mississippi School of Medicine.
St. Louis University School of Medicine.
University of Missouri School of Medicine.
Washington University Medical School.
John A. Creighton Medical College.
University of Nebraska College of Medicine.
Columbia University College of Physicians and Surgeons.
Cornell University Medical College.
Fordham University School of Medicine.
Syracuse University College of Medicine.
University and Bellevue Hospital Medical College.
University of Buffalo Medical Department.
University of North Carolina School of Medicine.
Wake Forest College School of Medicine.
University of North Dakota School of Medicine.
University of Cincinnati College of Medicine.
Ohio State University College of Medicine.
Western Reserve University School of Medicine.
University of Oklahoma School of Medicine.
Hahnemann Medical College and Hospital of Philadelphia.
University of Pennsylvania School of Medicine.
University of Pittsburgh School of Medicine.
University of the Philippines College of Medicine and Surgery.
Medical College of the State of South Carolina.
Meharry Medical College (Affiliated Member).
University of Tennessee College of Medicine.
Vanderbilt University Department of Medicine.
Baylor University School of Medicine.
University of Texas Department of Medicine.
University of Vermont College of Medicine.
Medical College of Virginia.
West Virginia University School of Medicine.
Marquette University School of Medicine.
University of Wisconsin Medical School.

The secretary-treasurer of the Association is Dr. Fred C. Zapffe, 3431 Lexington Street, Chicago.

## DESCRIPTION OF MEDICAL COLLEGES

Below are given brief descriptions of the medical colleges in the United States and Canada that are legally chartered to teach medicine, several of which do not grant degrees. The name, address, year of organization, history and date when first class graduated are given in each instance. Unless otherwise stated, a class graduated each subsequent year. Where official reports have been received from the college, information regarding faculty, entrance requirements, length of term, fees, students (excluding specials and postgraduates), graduates, name of dean and next session is given without discrimination, regardless as to whether the college is sectarian or not. In a few instances in which such reports were not received, the information published is from other reliable sources. Figures for graduates include all who graduated since July 1, 1916. Extracts of rules and the membership of the Association of American Medical Colleges are shown following the list of colleges. Figures showing population of cities and states are taken from the United States Census Bureau's estimate for 1915. Statements have been added showing the preliminary requirements held by state licensing boards where those requirements include one or two years of collegiate work. Six states, Illinois, Michigan, New Jersey, North Dakota, Pennsylvania and Rhode Island require a year's hospital internship before a license will be granted.

### ALABAMA

Alabama, population 2,301,277, has one medical college, the School of Medicine of the University of Alabama, located in Mobile, a city with a population of 56,536.

In order to secure licenses to practice medicine in Alabama, students matriculating in the session of 1915-16 and thereafter must have completed *two years* of work in an approved college of liberal arts, including courses in physics, chemistry, biology and a modern language, prior to entering on the study of medicine.

#### Mobile

UNIVERSITY OF ALABAMA SCHOOL OF MEDICINE, St. Anthony and Lawrence Streets.—Organized in 1859 as the Medical College of Alabama. Classes were graduated in 1861 and in all subsequent years except 1862 to 1868 inclusive. It was reorganized as the Medical Department of the University of Alabama in 1897. All property was transferred to the University of Alabama in 1907, when the present title was assumed. Two years of college work are required for admission. The faculty consists of 14 professors and 27 lecturers and assistants, a total of 41. The course of study covers four years of thirty-two weeks each. The total fees for each of the four years, respectively, are $160, $155, $155 and $180. The Dean is Dr. T. H. Frazer. The total registration for 1916–1917 was 43; graduates, 18. The fifty-second session begins Oct. 4, 1917, and ends June 5, 1918.

### ARKANSAS

Arkansas, population 1,713,102, has one medical college, the Medical Department of the University of Arkansas, located in Little Rock, a city of 55,158.

To secure licenses to practice medicine in Arkansas, students matriculating in the session of 1915-16 and thereafter must have completed at least one year of collegiate work including college courses in physics, chemistry, biology and a modern language before beginning the study of medicine. This applies to all graduates of 1919 and thereafter. Matriculants for the session of 1918-19 (graduates of 1922) and thereafter must have completed *two years* of premedical college work.

#### Little Rock

UNIVERSITY OF ARKANSAS MEDICAL DEPARTMENT, Markham and Center Streets.—Organized in 1879 as the Medical Department of Arkansas Industrial University. It assumed the present title in 1899. In 1911 the College of Physicians and Surgeons united with it and the new school was made an integral part of the University of Arkansas. The first class was graduated in 1880. The faculty consists of 17 professors and 43 lecturers and assistants, total 60. Entrance requirements in 1918–19 and thereafter will be two years of collegiate work beyond a four-year high school course. The course of study covers four years of thirty-two weeks each. The fees are $50 each year. The Dean is Dr. Morgan Smith. Total registration 1916–17 was 43; graduates, 15. The thirty-ninth session begins Sept. 17, 1917, and ends May 29, 1918.

### CALIFORNIA

California, population 2,848,275, has seven medical colleges. Four are located in San Francisco, a city of 448,502 inhabitants. They are Leland Stanford Junior University School of Medicine, College of Medicine of the University of California, the College of Physicians and Surgeons, and the Hahnemann Medical College of the Pacific. The College of Physicians and Surgeons, Medical Department of the University of Southern California is situated in Los Angeles, population 465,367. The Oakland College of Medicine and Surgery is in Oakland, population 190,803. The College of Medical Evangelists is located at Loma Linda, a village of 110 people.

To secure licenses to practice medicine in California under the "physician's and surgeon's" certificate, students matriculating in medical colleges in and after the session of 1915-16, prior to such matriculation, must have completed at least one year of recognized collegiate work including college courses in physics, chemistry, biology and a modern language. This applies to all graduates of 1919 and thereafter.

#### Berkeley-San Francisco

UNIVERSITY OF CALIFORNIA MEDICAL SCHOOL, University Campus, Berkeley; Second and Parnassus Avenues, San Francisco.—Organized in 1863 as the Toland Medical College. The first class graduated in 1865. In 1872 it became the Medical Department of the University of California. In 1909 the College of Medicine of the University of Southern California, at Los Angeles, by legislative enactment, became a clinical department. This Los Angeles portion was changed to a graduate school in 1914. In 1915 the Hahnemann Medical College of the Pacific was merged, and elective chairs in homeopathic materia medica and therapeutics were provided for. *Two years* of collegiate work are required for admission. The work of the first year and a half is given at Berkeley and the work of the last two and a half years at San Francisco. The faculty is composed of 39 professors and 100 associates and assistants, a total of 139. The course covers five years of nine months each, the fifth year to consist of an internship or of special work in a department of the medical school. Fees for the four years, respectively, are $195, $155, $160 and $150. The Dean is Dr. Herbert C. Moffitt, San Francisco. Total registration for 1916–17 was 129; graduates, 26. The forty-fifth session begins Aug. 20, 1917, and ends April 27, 1918.

#### Loma Linda-Los Angeles

COLLEGE OF MEDICAL EVANGELISTS.—Organized in 1909. The faculty numbers 52. The first class graduated in 1914. The course extends over four years of nine months each. *Two years* of college work are required for admission. The total fees for the four years, respectively, are $166, $161, $136 and $146. The Dean is Dr. P. T. Magan. The total registration for 1916–17 was 55; graduates, 13. The ninth session begins Sept. 2, 1917, and ends May 30, 1918.

#### Los Angeles

COLLEGE OF PHYSICIANS AND SURGEONS, MEDICAL DEPARTMENT OF THE UNIVERSITY OF SOUTHERN CALIFORNIA, 516 East Washington Street.—Organized in 1903, first class graduated in 1905; became Medical Department, University of Southern California, Aug. 11, 1909. The course covers four years of nine months each. *Two years* of collegiate work are required for admission. The faculty consists of 21 professors and 82 associate professors, lecturers and instructors, a total of 103. The fees for the four years, respectively, are $220, $217, $202 and $227. The Dean is Dr. Charles W. Bryson. The registration for 1916–17 was 136; graduates, 49. The next session begins Sept. 4, 1917, and ends June 6, 1918.

#### Oakland

OAKLAND COLLEGE OF MEDICINE AND SURGERY, Thirty-First and Grove Streets.—Organized in 1900, opened in 1902. The first class graduated in 1906. The faculty numbers 44. One year of college work is required for admission. The course covers four years of nine months each, and the classes are limited to ten students each. The total fees for each of the four years, respectively, are $185, $178, $150 and $175. The Registrar is Dr. Edward N. Ewer. The total registration for 1916–17 was 16; graduates, 4. The sixteenth session begins Aug. 20, 1917, and ends May 14, 1918.

#### San Francisco

COLLEGE OF PHYSICIANS AND SURGEONS, 344 Fourteenth Street.—Organized in 1896. The first class graduated in 1897. The faculty numbers 39. The course covers four years of nine months each. The fees for each of the first three years are $192.50 and $217.50 for the fourth year. The Dean is Dr. L. W. Spriggs. Registration for 1916–17 was 77; graduates, 8. The twenty-first session begins Sept. 3, 1917, and ends June 6, 1918. *Reported not recognized by licensing boards of thirty-nine states.*

#### San Francisco-Palo Alto

LELAND STANFORD JUNIOR UNIVERSITY SCHOOL OF MEDICINE, University Campus, Palo Alto, and Sacramento and Webster Streets, San Francisco.—Organized in 1908 when, by an agreement, the interests of Cooper Medical College were taken over. The first class was graduated in 1913. The faculty consists of 49 professors and 48 lecturers, assistants, etc., a total of 97. Three years of collegiate work are required for admission. The course covers five years of nine months each, including a year of practical or intern work. The total fees for the first four years, respectively, are $160, $155, $150 and $150. The Dean is Dr. W. Ophüls, San Francisco. The total registration for 1916–17 was 100; graduates, 23. The eighth session begins Oct. 1, 1917, and ends June 13, 1918.

### COLORADO

Colorado, with a population of 935,799, has one medical college, the University of Colorado School of Medicine. The

first two years of the course are given at Boulder, the seat of the university, while the last two, or clinical years, are given in Denver, which has a population of 253,161.

The Colorado State Board of Medical Examiners will register without further examination graduates of medical colleges in good standing who present licenses issued after examination by any other licensing board. The law permits any one, graduate or nongraduate, to try the board's written examination. No graduate of 1914 or thereafter is eligible to obtain a license in Colorado, or indorsement of his credentials, unless he graduated from a medical college which, at the time he matriculated, required at least *two years'* study, without conditions, in an accredited college of liberal arts, and this work must have included courses in physics, chemistry, biology and one modern language.

### Boulder-Denver

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE.—Organized in 1883. Classes were graduated in 1885 and in all subsequent years except 1898 and 1899. Denver and Gross College of Medicine was merged Jan. 1, 1911. The faculty embraces 14 professors, 18 associate and assistant professors, and 57 lecturers, instructors and assistants, a total of 89. The work embraces a graded course of four years of nine months each. The entrance requirements are *two years* of college work counting toward a degree in arts in an accredited college or university. The tuition is $75 per year for residents of Colorado, $100 for nonresidents. Laboratory fees are $10 for each of the first two years. The Dean is Dr. Charles N. Meader. The total registration for 1916–17 was 85; graduates, 21. The thirty-sixth session begins Sept. 10, 1917, and ends June 5, 1918.

## CONNECTICUT

Connecticut, with a population of 1,223,583, has one medical college, Yale University, School of Medicine, located in New Haven, population 147,095.

Candidates for license to practice medicine in Connecticut who graduate in 1914 or thereafter are not eligible unless, prior to entering on the study of medicine, they had completed, in addition to an accredited four-year high school education, at least nine months of collegiate work including college courses in physics, chemistry and general biology.

### New Haven

YALE UNIVERSITY SCHOOL OF MEDICINE, 150 York Street and Congress Avenue and Cedar Street.—Chartered in 1810 as the Medical Institution of Yale College. Organized in 1812; instruction began in 1813; first class graduated in 1814. A new charter in 1879 changed the name to the Medical Department of Yale College. In 1884, the Connecticut Medical Society surrendered such authority as had been granted by the first charter. In 1887, Yale College became Yale University. The faculty consists of 21 professors and 54 lecturers and assistants, a total of 75. The requirements for admission are *two years* of collegiate work plus evidence of satisfactory completion of courses in general physics, general inorganic chemistry, general biology, organic chemistry and physical chemistry or laboratory physics, all reasonably equivalent to the courses in these subjects in Yale University. The student also must have a reading knowledge of German. The course covers four years of nine months each. The fees for the four years, respectively, are approximately $205, $200, $200 and $210. The Dean is Dr. George Blumer. The total registration for 1916–17 was 77; graduates, 10. The 105th session begins Sept. 27, 1917, and ends June 19, 1918.

## DISTRICT OF COLUMBIA

The District of Columbia, population 358,679, has three medical colleges; George Washington University Medical School, Georgetown University, School of Medicine and Howard University, School of Medicine.

### WASHINGTON

GEORGE WASHINGTON UNIVERSITY MEDICAL SCHOOL, 1325 H Street, N.-W.—Organized in 1825 as the Medical Department of Columbian College. Also authorized to use the name National Medical College. Classes were graduated in 1826 and in all subsequent years, except 1834 to 1838, and 1861 to 1863, inclusive. The original title was changed to Medical Department of Columbian University in 1873. In 1903 it absorbed the National University Medical Department. In 1904, by an act of Congress, the title of George Washington University was granted to the institution. The faculty is composed of 37 professors and 57 instructors, demonstrators and assistants, a total of 94. *One year* of collegiate work will be required for admission for the session of 1917–18; thereafter *two years* of college work will be required. The course covers four years of thirty-two weeks each. The total fees are $175 each year. The Dean is Dr. William C. Borden. The total registration for 1916–17 was 114; graduates, 41. The ninety-sixth session begins Sept. 26, 1917, and ends June 5, 1918.

GEORGETOWN UNIVERSITY SCHOOL OF MEDICINE, 920 H Street, N.-W.—Organized in 1851. The first class graduated in 1852. The faculty contains 24 professors, 67 instructors and assistants; total, 91. *Two years* of collegiate work are required for entrance. The course of study covers four terms of eight and one-half months each. The fees for the first year are $165, and for each of the other three years, $150. The Dean is Dr. George M. Kober. The registration for 1916–17 was 60; graduates, 13. The sixty-seventh session begins Sept. 26, 1917, and ends June 12, 1918.

HOWARD UNIVERSITY SCHOOL OF MEDICINE, Fifth and W Streets, N.-W.—Chartered in 1867. Organized in 1869. The first class graduated in 1871. Colored students compose a majority of those in attendance. The faculty comprises 18 professors and 21 lecturers and assistants, 39 in all. The admission requirements are *two years* of collegiate work, including physics, chemistry, botany and zoology, English and two years of French or German. The course covers four years of thirty-two weeks each. The fees of each of the four sessions, respectively, are $140, $130, $130 and $137. The Dean is Dr. Edward A. Balloch. Registration for 1916–17 was 111; graduates, 13. The fiftieth session begins Oct. 1, 1917, and ends June 5, 1918.

## GEORGIA

Georgia, population 2,816,289, has two medical colleges, University of Georgia, Medical Department, located in Augusta, population 49,848, and the Emory University School of Medicine in Atlanta, a city of 184,873 population.

### Atlanta

EMORY UNIVERSITY SCHOOL OF MEDICINE, Butler and Armstrong Streets. — Organized in 1854. Classes graduated 1855 to 1861, when it suspended. Reorganized in 1865. A class graduated in 1865 and each subsequent year except 1874. In 1898 it merged with the Southern Medical College (organized in 1878), taking the name of Atlanta College of Physicians and Surgeons. In 1913 it merged with the Atlanta School of Medicine (organized in 1905), reassuming the name of Atlanta Medical College. Became the Medical Department of Emory University in 1915; assumed present title in 1917. One year of collegiate work is required for entrance; *two years* will be required for the session of 1918–19 and thereafter. It has a faculty of 39 professors and 83 instructors, assistants, etc., a total of 122. The course of study is four years of thirty-two weeks each. The fees for each of the four years, respectively, are $172, $160, $155 and $180. The Dean is Dr. W. S. Elkin. Total registration for 1916–17 was 149; graduates, 63. The next session begins Sept. 24, 1917, and ends May 28, 1918.

### Augusta

UNIVERSITY OF GEORGIA, MEDICAL DEPARTMENT, University Place.—Organized in 1828 as the Medical Academy of Georgia, the name being changed to the Medical College of Georgia in 1829. Since 1873 it has been known as the Medical Department of the University of Georgia. Entire property transferred to the university in 1911. Classes were graduated in 1833 and in all subsequent years except 1862 and 1863. The faculty includes 18 professors and 31 assistants, 49 in all. One year of collegiate work is required for entrance; *two years* will be required for the session of 1918–19 and thereafter. The course is four years of thirty-four weeks each. Fees are $150 each year for nonresidents of Georgia; for residents the fees for the four years, respectively, are $55, $50, $50 and $60. The Dean is Dr. W. H. Doughty, Jr. The total registration for 1916–17 was 55; graduates, 11. The eighty-sixth session begins Sept. 12, 1917, and ends May 29, 1918.

## ILLINOIS

Illinois, population 6,069,519, has eight medical colleges, two of which give instruction at night, all located in Chicago, a city of 2,447,045 inhabitants, and are as follows: Rush Medical College, Northwestern University Medical School, University of Illinois College of Medicine, Hahnemann Medical College and Hospital, Loyola University School of Medicine, Chicago College of Medicine and Surgery, Jenner Medical College, and the Chicago Hospital College of Medicine.

To be eligible for license to practice medicine in Illinois, students matriculating in the session of 1915-16 and thereafter, in addition to an accredited four-year high school education, must have completed at least a year of collegiate work including courses in physics, chemistry, biology and a modern language, to be taken either in a preliminary year given by a recognized medical college, or in an approved college of liberal arts. Graduates of 1923 and thereafter shall have completed over a year's internship in a hospital.

### Chicago

RUSH MEDICAL COLLEGE.—This school was founded in 1837, organized in 1843, was the medical department of Lake Forest University from 1887 until 1898, when it became affiliated with the University of Chicago. The first class graduated in 1844. The faculty is composed of 107 professors, 167 associates, instructors, etc., a total of 274. The requirements for admission are *two years* of college work, including courses in college chemistry, physics and biology, and a reading knowledge of German or French. Classes are limited to 100 students in each of the freshman and sophomore classes, and to 120 students in each of the clinical years. No application for admission is accepted after September 1. The course covers four years of eight and a half months each, and a fifth year, consisting of a hospital internship or of a fellowship in one of the departments. All freshman and sophomore studies are given at the University of Chicago. The clinical years are given in the building at the corner of Wood and Harrison Streets. The tuition fees are $180 each year. A matriculation fee of $5 is paid but once, and there are incidentals amounting from $5 to $7 annually. The Dean is Dr. John M. Dodson. Total registration 1916–17 was 567; graduates, 124. The seventy-fourth session begins Oct. 1, 1917, and ends June 15, 1918.

NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, 2431 South Dearborn Street.—Organized in 1859 as the Medical Department of Lind Univer-

sity. First class graduated in 1860. In 1864 it became independent as the Chicago Medical College. It united with Northwestern University in 1869, but retained the name of Chicago Medical College until 1891, when the present name was taken. Became an integral part of Northwestern University in 1905. The faculty comprises 60 professors and 88 lecturers and assistants, a total of 148. The requirements for admission are such as will admit to the College of Liberal Arts of Northwestern University, plus *two years* of college work, including courses in physics, chemistry, biology and a modern language. The course covers four years of eight months each. The fees for the four years, respectively, are $190, $195, $190 and $206. The Dean is Dr. Arthur I. Kendall. The total registration for 1916–17 was 247; graduates 42. The fifty-eighth session begins Oct. 2, 1917, and ends June 8, 1918.

UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE, Honore and Congress Streets.—Organized in 1882 as the College of Physicians and Surgeons. The first class graduated in 1883. It became the Medical Department of the University of Illinois by affiliation in 1897 and an integral part in 1910. The relationship with the university was canceled in June, 1912, but restored in March, 1913, when the present title was assumed. The American Medical Missionary College was absorbed in 1910. *Two years* of collegiate work are required for admission. The faculty is composed of 48 professors, 80 assistants and instructors, a total of 128. The total fees for the four years, respectively, are $155, $160, $150 and $165. The Dean is Dr. Albert C. Eycleshymer. The thirty-sixth session begins Oct. 1, 1917, and ends June 12, 1918.

CHICAGO COLLEGE OF MEDICINE AND SURGERY, 706 South Lincoln Street.—Organized in 1901 as the American College of Medicine and Surgery (Chicago Eclectic Medical College). The latter part of the name was dropped in 1902 and it became the Medical Department of Valparaiso University. Eclecticism was dropped in 1905. The present title was assumed in 1907. One year of collegiate work, including courses in physics, chemistry and biology, is required for admission. The course covers four years of eight months each. The faculty numbers 172. The total fees of each of the four years are $155; matriculation fee, $5. The Secretary is Dr. G. E. Wyneken. The total registration for 1916–17 was 415; graduates, 182. The seventeenth session begins Sept. 25, 1917, and ends May 28, 1918.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL OF CHICAGO, 2811 Cottage Grove Avenue.—Organized in 1859. The first class was graduated in 1861. Absorbed the Chicago Homeopathic Medical College in 1904. The faculty includes 56 professors and 27 lecturers, assistants, etc., a total of 83. *Two years* of collegiate work are required for admission. *Two years* of collegiate work are to be required from and after 1918. The course extends over four years of eight months each. The tuition fees for the four years, respectively, are $176.50, $161.50, $176.50 and $191.50. The Dean is Dr. Joseph P. Cobb. The total registration for 1916–17 was 76; graduates, 30. The fifty-eighth session begins Sept. 24, 1917, and ends June 6, 1918.

LOYOLA UNIVERSITY SCHOOL OF MEDICINE, Fulton and Ada Streets.—Organized in 1868 as the Bennett College of Eclectic Medicine and Surgery. Dropped Eclecticism and became Bennett Medical College in 1909. In 1910 it absorbed the Illinois Medical College and in 1911 the Reliance Medical College. The first class graduated in 1870. Became an integral part of Loyola University in 1915. Present title in 1916. The faculty numbers 111. The course covers four years of thirty-two weeks each. One year of collegiate work is required for admission, including courses in physics, chemistry and biology. The fees are $150 each year; matriculation fee, $5; graduation fee, $25. The Acting Dean is Dr. Alfred de Roulet. The total registration for 1916–17 was 228; graduates, 83. The next session begins Sept. 25, 1917, and ends June 1, 1918.

JENNER MEDICAL COLLEGE, an afternoon and night school, located at 701 South Wood Street.—Organized in 1892. Classes were graduated in 1896 and all subsequent years. The fees for each of the four years, respectively, are $140, $135, $135 and $175. The Secretary is Dr. John D. MacKellar. Total registration for 1916–17 was 118; graduates, 14. The next session begins Sept. 19, 1917, and ends June 22, 1918. *Reported not recognized by the licensing boards of thirty-eight states.*

CHICAGO HOSPITAL COLLEGE OF MEDICINE, another afternoon and night school, located at 3832 Rhodes Avenue.—Organized in 1911; chartered in 1912. Total registration for 1916–17 was 53; graduates reported, 7. *Official reports indicate that the diplomas from this college are not recognized by the licensing boards of thirty-eight states.*

## INDIANA

Indiana, population 2,798,142, has one medical college, the Indiana University School of Medicine, located at Indianapolis, a city of 265,578 people, except that the work of the first year is offered also at Bloomington, the seat of the University.

Candidates for license to practice medicine in Indiana who matriculated between Jan. 11, 1910, and Jan. 1, 1911, must have completed one year of collegiate work, in addition to an accredited four-year high school course, prior to beginning the study of medicine. Those matriculating subsequent to Jan. 1, 1911, must have completed *two years* of work in a recognized college of liberal arts.

### Bloomington and Indianapolis

INDIANA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1903, but did not give all of the work of the first two years of the medical course until 1905. In 1907, by union with the State College of Physicians and Surgeons, the complete course in medicine was offered. In 1908 the Indiana Medical College, which was formed in 1905 by the merger of the Medical College of Indiana (organized in 1878), the Central College of Physicians and Surgeons (organized in 1879), and the Fort Wayne College of Medicine (organized in 1879), merged into it. The first class was graduated in 1908. The faculty consists of 65 professors and 76 lecturers, associates and assistants, a total of 161. *Two years* of collegiate work are required for admission. The work of the first year is emphasized only at Bloomington. The work of the other three years is all at Indianapolis. The fees for the four years, respectively, are $100, $100, $130 and $130. A fifth optional intern year leading to the "M.D. cum laude" has been added. The Secretary at Bloomington is Dr. B. D. Myers; the Dean is Dr. Charles P. Emerson, Indianapolis. The total registration for 1916–17 was 175; graduates, 37. The next session begins Sept. 17, 1917, and ends June 12, 1918.

## IOWA

Iowa, population 2,221,038, has two medical colleges. The College of Medicine and the College of Homeopathic Medicine of the State University of Iowa, both located in Iowa City, population 11,200.

Candidates for license to practice medicine in Iowa who graduate subsequent to Jan. 1, 1915, must have completed *two years* of work in an approved college of liberal arts prior to beginning the study of medicine, this preliminary college work to have included courses in physics, chemistry, biology and a foreign language.

### Iowa City

STATE UNIVERSITY OF IOWA COLLEGE OF MEDICINE, University Campus.—Organized in 1869. First session began in 1870. First class graduated in 1871. Absorbed Drake University College of Medicine in 1913. The faculty is made up of 27 professors, 24 lecturers, demonstrators and assistants, a total of 51. *Two years* of collegiate work, including courses in physics, chemistry, biology and French or German, are required for admission. The course of study covers four years of thirty-six weeks each. The tuition fee for residents of Iowa is $85 per year and for nonresidents $100, plus a matriculation fee of $10 and a graduation fee of $10. The Dean is Dr. Lee Wallace Dean, Iowa City. Total registration for 1916–17 was 162; graduates, 20. The forty-eighth session begins Sept. 17, 1917, and ends June 7, 1918.

STATE UNIVERSITY OF IOWA COLLEGE OF HOMEOPATHIC MEDICINE.—Organized in 1877. The first class graduated in 1878. Class each subsequent year except 1914. The faculty is composed of 15 professors and 11 lecturers and assistants, a total of 26. The work of the first two years is taken in classes with the students of the College of Medicine of the State University of Iowa, and it has the same entrance and fee requirements. The Dean is Dr. George Royal. Total registration for 1916–17 was 7; graduate, 1. The fortieth session begins Sept. 17, 1917, and ends June 7, 1918.

## KANSAS

Kansas, population 1,807,221, has one medical college. The School of Medicine of the University of Kansas gives its first two years in Lawrence, population 12,915, and the last two years in Rosedale, a suburb of the two Kansas Cities, which together have a population of 392,693.

Candidates for license to practice medicine in Kansas who matriculated in the session of 1910-11 and thereafter must present credentials showing that they matriculated in and graduated from a medical college which required for admission at least one year of collegiate work including college courses in physics, chemistry and biology in addition to an accredited four-year high school course. This applies to graduates of 1914 and thereafter. Students matriculating in 1918-19 (graduates of 1922) and thereafter will be required to have completed *two years* of premedical college work.

### Lawrence and Rosedale

UNIVERSITY OF KANSAS SCHOOL OF MEDICINE.—Organized in 1880. It offered only the first two years of the medical course until in 1905, when it merged with the Kansas City (Mo.) Medical College, founded in 1869, the College of Physicians and Surgeons, founded in 1894, and the Medico-Chirurgical College, founded in 1897. First class graduated in 1906. The clinical courses are given at Rosedale. Absorbed Kansas Medical College in 1913. The faculty, including lecturers and clinical assistant, numbers 57. The requirements for admission are *two years* of collegiate work. The course covers four years of nine months each. The total fees are, for each of the first two years, $60 and for the last two years $100. The Dean is Dr. S. J. Crumbine; Associate Dean, Dr. M. T. Sudler. The total registration for 1916–17 was 118; graduates, 19. The thirty-eighth session begins Sept. 20, 1917, and ends June 12, 1918.

## KENTUCKY

Kentucky, population 2,365,185, has one medical college, the University of Louisville Medical Department, situated in Louisville, a city of 237,012 inhabitants.

To be eligible for license to practice medicine in Kentucky all students matriculating in and after the session of 1914-15 must have completed, in addition to an accredited four-year high school course, at least one year's work in an approved college of liberal arts, including college courses in physics, chemistry, biology and a modern language.

### Louisville

UNIVERSITY OF LOUISVILLE MEDICAL DEPARTMENT, First and Chestnut Streets.—Organized in 1837 as the Louisville Medical Institute. The first class graduated in 1838, and a class graduated in each subsequent

year except in 1863. In 1846 the present name was assumed. In 1907 it absorbed the Kentucky University Medical Department. In 1908 it absorbed the Louisville Medical College, the Hospital College of Medicine and the Kentucky School of Medicine. One year of collegiate work is required for admission. It has a faculty of 30 professors and 64 lecturers and assistants, a total of 94. The course covers four years of thirty-two weeks each. The fees for each of the four years, respectively, are $175, $176, $179 and $183. The Dean is Dr. Henry Enos Tuley. The total registration for 1916–17 was 118; graduates, 66. The next session begins Sept. 25, 1917, and ends June 6, 1918.

## LOUISIANA

Louisiana, having a population of 1,801,306, contains one medical college, the School of Medicine of the Tulane University of Louisiana, situated in New Orleans, a city of 366,484.

Candidates for license to practice medicine in Louisiana who graduate in 1919 and 1922 must present evidence that they had successfully completed, at an approved college or university, respectively, one year and *two years* of work including biology, physics, chemistry and a modern language, before entering on the study of medicine. These requirements apply to all students who matriculated, respectively, in 1915 and 1918.

### New Orleans

TULANE UNIVERSITY OF LOUISIANA SCHOOL OF MEDICINE, University Campus and 1551 Canal Street.—Organized in 1834 as the Medical College of Louisiana. Classes were graduated in 1835 and in all subsequent years, except 1863-65, inclusive. It was transferred to the Medical Department of the University of Louisiana in 1847 and became the Medical Department of the Tulane University of Louisiana in 1884. Present name in 1913, when it became the School of Medicine of the College of Medicine of the Tulane University of Louisiana. The faculty has 27 professors and 89 assistant professors, instructors, demonstrators, etc., a total of 116. The course covers four years of thirty-two weeks each. One year of collegiate work is required for admission. Two years of college work will be required for admission in 1918 and thereafter. Total fees for each of the four years, respectively, are $190, $190, $185 and $215. The Dean is Dr. Isadore Dyer. The total registration for 1916–17 was 267; graduates, 52. The eighty-third session begins Sept. 26, 1917, and ends June 5, 1918.

## MAINE

Main, population 767,638, has one medical college, the Bowdoin Medical School, located in Brunswick and Portland, the latter having a population of 62,161.

### Brunswick-Portland

BOWDOIN MEDICAL SCHOOL. The Medical Department of Bowdoin College. The first two years are given at Bowdoin College, Brunswick, the last two at Portland, building located on Chadwick Street.—Organized in 1820 as the Medical School of Maine. The first class graduated in 1821. Present title assumed in 1915. The faculty numbers 66. *Two years* of collegiate work, including courses in physics, chemistry and biology are required for admission. The course covers four years of eight months each. The total fees for each of the four years, respectively, are $120, $120, $110 and $110. The Dean is Dr. Addison S. Thayer, 10 Deering Street, Portland. The total number of students in 1916–17 was 54; graduates, 10. The ninety-seventh session begins Oct. 11, 1917, and ends June 20, 1918.

## MARYLAND

Maryland, with a population of 1,351,941, contains two medical colleges, located in Baltimore, a city with 584,605 inhabitants. They are as follows: Johns Hopkins University Medical Department, and the University of Maryland School of Medicine and College of Physicians and Surgeons, the last two having been merged.

To be eligible to practice medicine in Maryland, all students matriculating in the session of 1914-15 and thereafter, in addition to a four-year high school education, must have completed a year of college work including courses in physics, chemistry, biology and French or German, prior to beginning the study of medicine. Students matriculating in 1918-19 and thereafter must have completed *two years* of college work.

### Baltimore

JOHNS HOPKINS UNIVERSITY MEDICAL DEPARTMENT, Washington and Monument Streets.—Organized in 1893. The first class graduated in 1897. The faculty consists of 48 professors and 129 clinical professors, etc., a total of 177. The requirements for admission demand that the applicant either has (*a*) completed the chemical-biologic course which leads to the A.B. degree in the university, or (*b*) graduated at an approved college or scientific school and has a knowledge of French and German, physics, chemistry and biology, such as may be obtained from a year's course. The course extends over four years of eight and one-half months each. The total fees are $257 each year. The Dean is Dr. J. Whitridge Williams. Total registration for 1916–17 was 359; graduates, 92. The twenty-fifth session begins Oct. 2, 1917, and ends June 11, 1918.

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE AND THE COLLEGE OF PHYSICIANS AND SURGEONS, Lombard and Green Streets.—Organized in 1807 as the College of Medicine of Maryland. The first class graduated in 1810. In 1812 it became the University of Maryland School of Medicine. Baltimore Medical College was merged into it in 1913. In 1915 the College of Physicians and Surgeons was merged and the present name assumed. The combined faculty numbers 166. A year of collegiate work is required for admission. Beginning with the session of 1918–19 *two years* of college work will be required. The course covers four years of eight months each. The total fees are $170 each year; graduation fee, $30. The Dean is Dr. J. M. H. Rowland. Total registration for 1916–17 was 298; graduates, 82. The one hundred and eleventh session begins Oct. 1, 1917, and ends June 3, 1918.

## MASSACHUSETTS

Massachusetts, population 3,662,339, has four medical colleges: Medical School of Harvard University, Boston University School of Medicine, College of Physicians and Surgeons and Tufts College Medical School. They are all situated in Boston, a city of 745,139.

### Boston

MEDICAL SCHOOL OF HARVARD UNIVERSITY, 240 Longwood Avenue.—Organized in 1782. The first class graduated in 1788. It has a faculty of 57 professors and 187 instructors and assistants, a total of 244. Candidates for admission must present a college degree or two years of work leading to such a degree with standing in the upper third of the class. The college work must include a year of physics, biology, general chemistry, a half year of organic chemistry, and a reading knowledge of French or German. The total fee for each year is $225. The Dean is Dr. Edward H. Bradford. The total registration for 1916–17 was 357; graduates, 67. The one hundred and thirty-sixth session begins Sept. 24, 1917, and ends June 20, 1918.

BOSTON UNIVERSITY SCHOOL OF MEDICINE, 80 East Concord Street.—Organized in 1873. In 1874 the New England Female Medical College, founded in 1848, was merged into it. The first class graduated in 1874. *Two years* of collegiate work are required for admission. The faculty includes 23 professors, 46 associates, etc., making a total of 69. The course covers four years of eight months each. Total fees for each of the four years, respectively, are $170, $157, $157 and $180. The Dean is Dr. John P. Sutherland. Total registration for 1916–17 was 62; graduates, 24. The forty-fifth session begins Oct. 4, 1917, and ends June 5, 1918.

TUFTS COLLEGE MEDICAL SCHOOL, 416 Huntington Avenue.—Organized in 1893 as the Medical Department of Tufts College. The first class graduated in 1894. It has a faculty of 41 professors and 83 assistants, lecturers, etc., a total of 124. One year of collegiate work is required for admission. *Two years* of college work will be required for the session of 1918–19 and thereafter. The course covers four years of eight months each. The total fees for each of the four years are $159.50, $162, $155 and $155. The Dean is Dr. Charles F. Painter. Total registration for 1916–17 was 382; graduates, 76. The twenty-fourth session begins Sept. 20, 1917, and ends June 17, 1918.

COLLEGE OF PHYSICIANS AND SURGEONS, 517 Shawmut Avenue.—Organized in 1880. The first class graduated in 1882. Total attendance of medical students during 1916–17 was about 53. There were 11 graduates. *This college has been reported not recognized by the Massachusetts Medical Society and by the licensing boards of thirty-nine states.*

## MICHIGAN

Michigan, population 3,015,442, has three medical colleges. Two of these, the University of Michigan Department of Medicine and Surgery and the Homeopathic Medical College of the University of Michigan, are located at Ann Arbor, a city of 14,979 people. The Detroit College of Medicine and Surgery is located at Detroit, a city of 554,717 inhabitants.

To be eligible for license to practice medicine in Michigan, all students matriculating in and after the session of 1914-15, in addition to an accredited four-year high school education, must have completed at least one year's work in an approved college of liberal arts, including college courses in physics, chemistry, biology and French or German, prior to beginning the study of medicine. Students matriculating in 1918-19 (graduates of 1922) and thereafter will be required to have completed *two years* of such college work.

### Ann Arbor

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL.—Organized in 1850 as the University of Michigan Department of Medicine and Surgery. The first class graduated in 1851. Present title assumed in 1915. It has a faculty composed of 22 professors and 69 associates, instructors, etc., a total of 91. The entrance requirements are *two years* of college work, including courses in chemistry, physics and biology, with laboratory work, and a reading knowledge of one modern language. The curriculum embraces four years of nine months each. The total fees for Michigan students for each of the four years, respectively, are $112, $102, $102 and $112, and for nonresidents, respectively, $147, $122, $122 and $132. The Dean is Dr. Victor C. Vaughan. The total registration for 1916–17 was 322; graduates, 62. The sixty-eighth session begins Oct. 2, 1917, and ends June 27, 1918.

UNIVERSITY OF MICHIGAN HOMEOPATHIC MEDICAL SCHOOL.—Organized in 1875. The first class graduated in 1877. The work of the first two years is taken in the same classes with the Medical School of the University of Michigan, and the fees charged are the same. The entrance requirements are *two years* of collegiate work. The Dean is Dr. W. B. Hinsdale. The total registration for 1916–17 was 48; graduates, 8. The next session begins Oct. 2, 1917, and ends June 27, 1918.

### Detroit

DETROIT COLLEGE OF MEDICINE AND SURGERY, 250 St. Antoine Street.—Organized as the Detroit College of Medicine in 1885 by consolidation of Detroit Medical College, organized in 1868, and the Michigan College of Medicine, organized in 1880. Reorganized with present title in 1913. The first class graduated in 1886. Entrance requirements for 1917–18 are one year of collegiate work; thereafter *two years* of college work will be required. The faculty embraces 23 professors, 147 lecturers, etc., a total of 170. The course covers four years of eight months each. The fees for the four years, respectively, are $165, $155, $150 and $130. The Secretary is Dr. W. H. MacCraken. The total registration for 1916–17 was 161; graduates, 64. The thirty-third session begins Sept. 24, 1917, and ends May 29, 1918.

## MINNESOTA

Minnesota, population 2,226,761, contains one medical school, the University of Minnesota Medical School, situated in Minneapolis, a city of 353,460 inhabitants.

Candidates for license to practice medicine in Minnesota who graduated subsequent to June 1, 1912, in addition to an accredited four-year high school education, must have completed *two years* of work the equivalent of that done in the liberal arts department of the University of Minnesota, including courses in physics, chemistry and biology, prior to beginning the study of medicine.

### Minneapolis

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL.—Organized in 1883 as the University of Minnesota College of Medicine and Surgery, reorganized in 1888 by absorption of St. Paul Medical College and Minnesota Hospital College. The first class graduated in 1889. In 1908 the Minneapolis College of Physicians and Surgeons, organized in 1883, was merged. In 1909 the Homeopathic College of Medicine and Surgery was merged. Present title in 1913. The faculty includes 54 professors and 91 instructors and assistants, a total of 151. The curriculum covers four years of nine months each and a year's internship in an approved hospital. The entrance requirements are *two years* of university work which must include one year each of physics, general chemistry, qualitative analysis, zoology or botany, and French or German, all in addition to a four-year high school course, including two years of Latin. Students entering hereafter will be required to secure a degree of B.S. or A.B. before the M.D. is granted. Total fees are $150 each year. The Dean is Dr. E. P. Lyon. The total registration for 1916–17 was 265, graduates, 17. The thirtieth session begins Oct. 10, 1917, and ends June 20, 1918.

## MISSISSIPPI

Mississippi, population 1,926,778, has one medical college, the Department of Medicine of the University of Mississippi, which is located at Oxford, a city of 2,014 inhabitants.

Candidates for license to practice medicine in Mississippi who matritculate in the session of 1915-16 and thereafter, in addition to a standard four-year high school education, must have completed a year's work in an approved college or university, including courses in physics, chemistry, biology and a modern language, before entering on the study of medicine.

### Oxford

UNIVERSITY OF MISSISSIPPI SCHOOL OF MEDICINE.—Organized in 1903. Gives only the first two years of the medical course. In 1908 a clinical department was established at Vicksburg, but was discontinued in 1910 after graduating one class. The session extends over eight and a half months. Entrance requirements for 1917–18 are one year of collegiate work in addition to an accredited four-year high school education; thereafter, *two years* of college work will be required. The total fees each year are $122. The faculty numbers 18. The Dean is Dr. W. S. Leathers. The total registration for 1916–17 was 60. The fifteenth session begins Sept. 19, 1917, and ends June 4, 1918.

## MISSOURI

Missouri, population 3,391,789, has eight medical colleges. St. Louis, population 745,988, contains four of these, viz., the School of Medicine of St. Louis University, Washington University Medical School, the Medical Department of the National University of Arts and Sciences, and the St. Louis College of Physicians and Surgeons. Kansas City, with a population of 289,879, has three colleges, the Electic Medical University, the Kansas City College of Medicine and Surgery and the Southwest School of Medicine and Hospital. The School of Medicine of the University of Missouri is at Columbia, a town of 12,103 people.

### Columbia

UNIVERSITY OF MISSOURI SCHOOL OF MEDICINE.—Organized at St. Louis in 1845; was discontinued in 1855, but was reorganized at Columbia in 1872. Teaching of the clinical years was suspended in 1909. The faculty includes 10 professors and 15 assistant professors, lecturers, etc., a total of 25. The course covers two years of nine months each. The entrance requirements are *two years* of college work including French or German, 8 hours; general zoology, 8 hours; physics, 8 hours; inorganic chemistry, 8 hours, and general bacteriology, 3 hours. Total fees are $73 for the first and $45 for the second year. The acting Dean is Dr. Guy L. Noyes. Total registration for 1916–17 was 85. The next session begins Sept. 17, 1917, and ends June 5, 1918.

### Kansas City

ECLECTIC MEDICAL UNIVERSITY, 309 East Tenth Street.—Organized at Kansas City, Mo., in 1898 with the present title. Moved to Kansas City, Kan., in 1907, and took the name of Western Eclectic College of Medicine and Surgery. Returned to Kansas City, Mo., in 1909 and resumed the present title. First class graduated in 1900. The faculty numbers 34. Total fees are $150 per year. The Secretary is Dr. Samuel McCubbin. The total registration for 1916–17 was 31; graduates, 11. The next session begins Sept. 10, 1917, and ends May 3, 1918. *Reported not in good standing by the Missouri State Board of Health and by thirty other state licensing boards.*

KANSAS CITY COLLEGE OF MEDICINE AND SURGERY, Eclectic, Twenty-Third and Holmes Streets.—An offshoot of the Eclectic Medical University, organized in 1915. Total registration for 1916–17 was 114; graduates, 21. Since this school is an offshoot of a Class C medical college and is *reported not recognized by the Missouri State Board of Health*, no higher rating can be granted to it, pending an inspection.

### St. Louis

WASHINGTON UNIVERSITY MEDICAL SCHOOL, Kingshighway and Euclid Avenue.—Organized in 1842 as the Medical Department of St. Louis University. In 1855 it was chartered as an independent institution under the name of St. Louis Medical College. The first class graduated in 1843. In 1891 it became the Medical Department of Washington University. In 1899 it absorbed the Missouri Medical College. The faculty comprises 30 professors and 78 lecturers, instructors, etc., a total of 108. *Two full years* of college work are required for admission, including courses in English, physics, chemistry and biology and a reading knowledge of German. The course is four years of eight months each. The total fees for the four years are, respectively, $155, $150, $150 and $155. The Dean is Dr. Philip A. Shaffer. The total registration for 1916–17 was 125; graduates, 31. The next session begins Sept. 27, 1917, and ends June 13, 1918.

ST. LOUIS UNIVERSITY SCHOOL OF MEDICINE, 1402 South Grand Avenue.—Organized in 1901 as the Marion-Sims-Beaumont Medical College by union of Marion Sims Medical College, organized in 1890, and Beaumont Hospital Medical College, organized in 1886. First class graduated in 1902. It became the Medical Department of St. Louis University in 1903. The faculty is composed of 45 professors, 75 lecturers and assistants, a total of 120. One year of college subjects preliminary to the four years of medical subjects is given in the medical school. After Nov. 1, 1917, *two years* of collegiate work will be required for admission. The curriculum covers four years of thirty-two weeks each. The total fees are $155 each year. The Dean is Dr. Hanau W. Loeb. The total registration for 1916–17 was 254; graduates, 41. The next session begins Oct. 1, 1917, and ends June 1, 1918.

NATIONAL UNIVERSITY OF ARTS AND SCIENCES, Medical Department, Garrison and Lawton Avenues.—Organized in 1873 as the American Medical College, and Eclectic Institution. Eclecticism dropped in 1910. Absorbed the Barnes Medical College in 1911. Became the Medical Department of the National University of Arts and Sciences in 1912. St. Louis College of Physicians and Surgeons was merged in 1915, but withdrew in 1916. Two classes were graduated each year from 1874 to 1883, inclusive. Since then one class has graduated each year. The Secretary is Dr. E. L. Cooley. The total registration for 1916–17 was 64; graduates, 38. The next session begins June 1, 1917, and ends Feb. 5, 1918.

ST. LOUIS COLLEGE OF PHYSICIANS AND SURGEONS, Jefferson and Gamble Streets.—Organized in 1869. Classes graduated in 1870 and each subsequent year until 1873 when it suspended. Reorganized in 1879. Classes graduated in 1880 and subsequent years until 1915 when it merged with the Medical Department of the National University of Arts and Sciences. Reestablished in 1916. Total fees each year are $140; graduation fee, $25. The Secretary is Dr. E. L. Marks. Registration during 1916–17 was 46; graduates, 11. The next session begins Oct. 1, 1917, and ends June 3, 1918.

## NEBRASKA

Nebraska, population 1,258,624, has three medical colleges. The University of Nebraska College of Medicine and the John A. Creighton Medical College of Omaha, population 135,455, and the Lincoln Medical College at Lincoln, population 46,028.

### Lincoln

LINCOLN MEDICAL COLLEGE, Eclectic. Corner 13th and P Streets, Lincoln.—Organized in 1890 as the Lincoln Medical College. The first class graduated in 1891. Became Cotner University Medical College in 1911. Affiliation with Cotner University canceled and present title resumed in 1915. The Dean is Dr. F. L. Wilmeth. The total registration for 1916–17 was 25; graduates, 4. The next session begins Sept. 15, 1917, and ends June 1, 1918. *Official reports indicate that diplomas from this college are not recognized by the licensing boards of thirty-five states.*

### Omaha

JOHN A. CREIGHTON MEDICAL COLLEGE, Fourteenth and Davenport Streets. It is the Medical Department of Creighton University.—Organized in 1892. The first class graduated in 1893. It has a faculty of 18 professors and 36 associates, lecturers and assistants, a total of 54. One year of collegiate work is required for admission. Beginning with the session of 1918–19 *two years* of collegiate work will be required. The course of study embraces four years of eight months each. The total fees each year for the four years are, respectively, $157, $147, $147 and $152. The Dean is Dr. James Ross Clemens. Total registration for 1916–17 was 108; graduates, 43. The thirty-sixth session begins Sept. 21, 1917, and ends June 1, 1918.

UNIVERSITY OF NEBRASKA COLLEGE OF MEDICINE, Forty-Second Street and Dewey Avenue.—Organized in 1881 as the Omaha Medical College. The first class graduated in 1882. It became the Medical Department of Omaha University in 1891. In 1902 it affiliated with the University of Nebraska, with the present title. The first two years were given at Lincoln and the last two in Omaha until 1913, when all four years were transferred to Omaha. The faculty is composed of 22 professors and 44 lecturers and instructors, total 66. *Two years* of collegiate work are required for admission, including courses in physics, chemistry, zoology and German. The fees for each of the four years, respectively, are $135, $130, $120 and $120. The Dean is Dr. Irving S. Cutter. Total registration for 1916-17 was 143; graduates, 16. The next session begins Sept. 13, 1917, and ends June 12, 1918.

## NEW HAMPSHIRE

New Hampshire, population 440,584, has one medical college, located at Hanover, population 2,075.

To be eligible for license to practice medicine in New Hampshire, all students matriculating in and after the session of 1915-16, in addition to a four-year high school education, must have completed at least *two years* of work in an approved college of liberal arts, prior to beginning the study of medicine.

DARTMOUTH MEDICAL SCHOOL.—Organized as New Hampshire Medical Institute in 1797. The first class graduated in 1798. It is under the control of the trustees of Dartmouth College. Clinical teaching was discontinued in 1914. The faculty is made up of 10 professors and 2 instructors, a total of 12. *Two years* of collegiate work are required for admission. The course covers nine calendar months in each year, or eight months of actual teaching. Candidates for the B.S. degree in Dartmouth College may substitute the work of the first two years in medicine for that of the junior and senior years in the academic department. Candidates for the A.B. degree may make a similar saving of one year. The fees for the two years in medicine are, respectively, $172 and $173. Dean, Dr. John M. Gile; Secretary, Colin C. Stewart. The total registration for 1916–17 was 40. The next session opens Sept. 20, 1917, and ends June 19, 1918.

## NEW YORK

New York State, population 10,086,568, has ten medical colleges. Seven of these, College of Physicians and Surgeons (Columbia University), Long Island College Hospital, New York Homeopathic Medical College and Hospital, New York Medical College and Hospital for Women, Cornell University Medical College, the University and Bellevue Hospital Medical College and Fordham University School of Medicine, are located in New York City, population 5,468,190. Albany Medical College is located in Albany, a city of 103,580 people. The University of Buffalo Medical Department is situated in Buffalo, population 461,335. The College of Medicine, Syracuse University, is in Syracuse, a city of 152,534 inhabitants.

### Albany

ALBANY MEDICAL COLLEGE, Lancaster and Jay Streets.—Organized in 1838. The first class graduated in 1839. It became the Medical Department of Union University in 1873. In 1915 Union University assumed full control. The faculty is composed of 8 professors and 60 instructors, assistants, etc., a total of 68. One year of collegiate work, including college courses in physics, chemistry, biology, English, and French or German is required for admission. Beginning with the session of 1918–19, *two years* of college work will be required for admission. The curriculum covers four years of eight months each. The fees for the four years, respectively, are $195, $175, $170 and $165. The Dean is Dr. Thomas Ordway. The total registration for 1916–17 was 110; graduates, 42. The eighty-seventh session begins Sept. 24, 1917, and ends June 7, 1918.

### Buffalo

UNIVERSITY OF BUFFALO MEDICAL DEPARTMENT, High Street, near Main.—Organized in 1846. The first class graduated in 1847. It absorbed the Medical Department of Niagara University in 1898. The faculty is composed of 30 professors and 82 lecturers, assistants, etc., a total of 112. One year of collegiate work, including college courses in physics, chemistry, biology, English and French or German are required for admission—*two years* of college work will be required in and after 1918. The course covers four years of eight months each. The total fees for the four years, respectively, are $200, $200, $175 and $175. The Dean is Dr. Thomas H. McKee. Total registration for 1916–17 was 196; graduates, 60. The seventy-second session begins Sept. 24, 1917, and ends June 7, 1918.

### New York

COLUMBIA UNIVERSITY COLLEGE OF PHYSICIANS AND SURGEONS, 437 West Fifty-Ninth Street.—Organized in 1807 by the regents of the University of the State of New York as their medical department. The first class graduated in 1811. In 1860 it became, by affiliation, the Medical Department of Columbia College. It was made a permanent part of Columbia College by legislative enactment in 1891. That institution became Columbia University in 1896. The faculty is composed of 89 professors and 172 instructors, demonstrators, etc., a total of 261. *Two years* of collegiate work, including courses in physics, chemistry, biology, English and either French or German are required for admission. The work covers four years of eight months each. The Dean is Dr. Samuel W. Lambert. The total fees for the four years, respectively, are $265, $251, $250 and $275. Total registration for 1916–17 was 491; graduates, 90. The one hundred and tenth session begins Sept. 26, 1917, and ends June 5, 1918.

CORNELL UNIVERSITY MEDICAL COLLEGE, First Avenue and Twenty-Eighth Street, New York City and Ithaca.—Organized in 1898. The first class was graduated in 1899. The work of the first year may be taken either in Ithaca or New York. The faculty is composed of 51 professors and 77 assistants, lecturers, instructors, etc., a total of 128. All candidates for admission must be graduates of approved colleges or scientific schools or seniors of approved colleges which will permit them to substitute the first year of this medical school for the fourth year of their college course and will confer on them the Bachelor degree on the completion of the year's work. The candidate must also have such knowledge of physics, inorganic chemistry and biology as may be obtained in college by a year's course in these subjects when accompanied by laboratory work. The fees for each of the four years are, respectively, $190, $185, $185 and $200. The Dean is Dr. William M. Polk. Total registration for 1916–17 was 165; graduates, 27. The twentieth session begins Oct. 1, 1917, and ends June 13, 1918.

FORDHAM UNIVERSITY SCHOOL OF MEDICINE, Bathgate Avenue and Fordham Road.—Organized in 1905 as the School of Medicine of St. John's College. Present title assumed in 1907. First class graduated in 1909. The faculty consists of 56 professors and 55 lecturers and assistants, a total of 111. The course of instruction covers four years of eight and a half months each. Total fees for the four years, respectively, are $225, $216, $212 and $210. A year's work in a recognized college of liberal arts, including college courses in physics, chemistry and biology is required for admission. *Two years* will be required in 1918 and thereafter. The Dean is Dr. William P. Healy. The total registration for 1916–17 was 297; graduates, 49. The thirteenth session begins Sept. 27, 1917, and ends June 10, 1918.

LONG ISLAND COLLEGE HOSPITAL, Henry Street, near Atlantic Avenue, Brooklyn.—Organized in 1858. The first class graduated in 1860. It has a faculty of 20 professors and 98 assistants, instructors, etc., a total of 118. A year of collegiate work, including college courses in physics, chemistry and biology is required for admission. In and after 1918–19 *two years* of collegiate work will be required for admission. The course covers four years of eight months each. Fees: first year, $255; second year, $250; third, $250, and $275 for the fourth year. The secretary is Dr. Otto V. Huffman. Total registration 1916–17 was 295; graduates, 70. The sixtieth session begins Sept. 24, 1917, and ends May 31, 1918.

NEW YORK HOMEOPATHIC MEDICAL COLLEGE AND FLOWER HOSPITAL, Eastern Boulevard, between Sixty-Third and Sixty-Fourth Streets.—Organized in 1858. Incorporated in 1860 as the Homeopathic Medical College of the State of New York. The title, New York Homeopathic Medical College, was assumed in 1869. Present title assumed in 1908. The first class graduated in 1861. The faculty consists of 26 professors and 55 assistants, lecturers, etc., a total of 81. The total fees are $200 each year. The Dean is Dr. Royal S. Copeland. Total registration for 1916–17 was 170; graduates, 42. The fifty-eighth session begins Sept. 25, 1917, and ends May 23, 1918.

NEW YORK MEDICAL COLLEGE AND HOSPITAL FOR WOMEN (Homeopathic), 17-21 West One Hundred and First Street.—Organized in 1863. The first class graduated in 1864. The faculty numbers 73. After Jan. 1, 1918, two years of collegiate work will be required for admission which must include courses in physics, chemistry, biology, English and one modern language. The course covers four years of thirty-two weeks each. The fees for each of the four years, respectively, are $180, $175, $160 and $180. The Dean is Dr. Cornelia C. Brant. The total registration for 1916–17 was 38; graduates, 12. The fifty-fifth session begins Sept. 19, 1917, and ends May 31, 1918.

UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE, First Avenue and Twenty-Sixth Street.—Organized in 1898 by the union of the New York University Medical College, organized in 1841, and the Bellevue Hospital Medical College, organized in 1861. It is the Medical Department of New York University. First class graduated in 1899. The faculty is composed of 59 professors and 83 instructors, etc., in all 142. The course covers four years of eight months each. Entrance requirements are one year of collegiate work, in addition to a standard four-year high school course, including college courses in physics, chemistry and biology. On and after Jan. 1, 1918 (session of 1918–19), *two years* of college work will be required for admission, including courses in the prescribed sciences and a modern language. The fees are $200 per year; graduation fee, $25. The Dean is Dr. Samuel A. Brown. Total registration for 1916–17 was 429; graduates, 64. The next session begins Sept. 26, 1917, and ends June 12, 1918.

### Syracuse

SYRACUSE UNIVERSITY COLLEGE OF MEDICINE, 307-311 Orange Street.—Organized in 1872, when the Geneva Medical College, chartered in 1834, was removed to Syracuse, under the title "The College of Physicians and Surgeons of Syracuse University." Present title assumed in 1875, when a compulsory three-year graded course was established. The first class graduated in 1873 and a class graduated each subsequent year. In 1889 the amalgamation with the university was made complete. Course extended to four years in 1896. *Two years* of a recognized college course are required for admission. The course covers four years of thirty-five weeks each. The fees are $200 annually; graduation fee, $10. The faculty is composed of 28 professors and 67 associate and assistant professors, lecturers and instructors. The Dean is Dr. John L. Heffron. The total enrolment for 1916–17 was 124; graduates, 29. The forty-seventh session begins Sept. 18, 1917, and ends June 12, 1918.

## NORTH CAROLINA

North Carolina, population 2,371,095, has three medical schools, each of which gives only the first two years of the medical course. The School of Medicine of the University of North Carolina is located at Chapel Hill, population 1,149. The Leonard Medical School is at Raleigh, population 19,980. Wake Forest College School of Medicine is at Wake Forest, population 1,443.

Graduates of 1918 (matriculants of 1914-15) and thereafter must have completed one year of college work including

courses in physics, chemistry and biology in addition to 14 units of high school work to be eligible for a license to practice medicine in North Carolina.

### Chapel Hill

UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE.—Organized in 1890. Until 1902 this school gave only the work of the first two years, when the course was extended to four years by the establishment of a department at Raleigh. The first class graduated in 1903. A class was graduated each subsequent year, including 1910, when the clinical department at Raleigh was discontinued. *Two years* of collegiate work are required for admission. The faculty is composed of 12 professors and 12 lecturers, assistants, etc., a total of 24. The total fees for the two years, respectively, are $124.50 and $122.50. The Dean is Dr. I. H. Manning. The total registration for 1916–17 was 64. The thirty-second session begins Sept. 11, 1917, and ends June 5, 1918.

### Raleigh

LEONARD MEDICAL SCHOOL.—Colored. This department of Shaw University was established in 1882. Classes were graduated in 1886, 1888 and in all subsequent years, including 1914 when clinical teaching was discontinued. A year of collegiate work is required for admission. It has a faculty of 8. The course covers four years of eight months each. The total fees for each year are $115. The Dean is Dr. George H. Stoddard. Total registration for 1916–17 was 8. The thirty-sixth session begins Sept. 26, 1917, and ends May 9, 1918.

### Wake Forest

WAKE FOREST COLLEGE SCHOOL OF MEDICINE.—This school was organized in 1902. The faculty, including the professors of chemistry, physics and biology, numbers 11. Only the first two years of the medical course are offered after the completion of freshmen and sophomore college work, and on this combined course the B.S. degree is conferred. Each annual course extends over nine months. The fees for each year aggregate $115. The Secretary is E. B. Earnshaw. The total registration for 1916–17 was 32. The sixteenth session begins Sept. 4, 1917, and ends May 24, 1918.

## NORTH DAKOTA

North Dakota, population 713,083, has one medical college, the School of Medicine of the University of North Dakota, which is situated at University, a suburb of Grand Forks, a city of 15,332 people. It gives only the first two years of the medical course.

Candidates for license to practice medicine in North Dakota who graduated in 1912 and thereafter, in addition to a four-year high school education, must have completed *two years* of work in an approved college of liberal arts including courses in Latin, physics, chemistry, botany and zoology, prior to beginning the study of medicine. Beginning in 1918 every applicant for a license must show evidence of having spent at least one year as an intern in a hospital.

### University

UNIVERSITY OF NORTH DAKOTA SCHOOL OF MEDICINE.—Organized in 1905. The faculty is composed of 4 professors and 12 instructors, a total of 16. The course consists of *two years* of academic work and two years of medicine, occupying nine months each year. The total fee for each of the medical years is $50. The Dean is Dr. Harley E. French. The total registration for 1916–17 was 33. The twelfth session begins Oct. 6, 1917, and ends June 26, 1918.

## OHIO

Ohio, population 5,038,627, has five medical colleges. Two of these, the Medical College of the University of Cincinnati and the Eclectic Medical College, are located in Cincinnati, a city of 406,706 inhabitants. Cleveland, population 656,975, contains one medical school, Western Reserve University School of Medicine. Columbus, population 209,722, contains the two departments of the Ohio State University, the College of Medicine and the College of Homeopathic Medicine.

### Cincinnati

UNIVERSITY OF CINCINNATI COLLEGE OF MEDICINE, Eden Avenue, Cincinnati General Hospital.—Organized in 1909 by the union of the Medical College of Ohio (founded in 1819) with the Miami Medical College (founded in 1852). The Medical College of Ohio became the Medical Department of the University of Cincinnati in 1896. Under a similar agreement, March 2, 1909, the Miami Medical College also merged into the University, when the title of Ohio-Miami Medical College of the University of Cincinnati was taken. Present title assumed in 1915. *Two years* of college work are required for admission. The faculty consists of 43 professors, 113 associates, assistants, etc., a total of 156. The course covers four years of eight months each. The fees for each of the first three years are $150 and for the fourth year, $170. The Dean is Dr. Christian R. Holmes. The total registration for 1916–17 was 94; graduates, 14. The next session begins Oct. 2, 1917, and ends June 15, 1918.

ECLECTIC MEDICAL COLLEGE, 630 West Sixth Street.—Organized in 1833 at Worthington as the Worthington Medical College. Removed to Cincinnati in 1843. In 1845 it was chartered as the Eclectic Medical Institute. In 1857 the American Medical College, organized in 1839, was merged into it, and in 1859 the Eclectic College of Medicine and Surgery, organized in 1856, was merged into it. In 1910 it assumed its present title. Classes were graduated in 1833 and in all subsequent years except 1839 to 1843, inclusive. It has a faculty of 26 professors and 8 lecturers and assistants, a total of 34. One year of college work is required for admission. The course covers four years of eight months each. The fees are $120 for each year; matriculation fee, $5; graduation fee, $10. The Secretary is Dr. John K. Scudder. Total registration for 1916–17 was 97; graduates, 29. The next session begins Sept. 14, 1917, and ends May 14, 1918.

### Cleveland

WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE, 1353 East Ninth Street.—Organized in 1843 as the Cleveland Medical College. The first class graduated in 1844. It assumed the present title in 1881. In 1910 it absorbed the Cleveland College of Physicians and Surgeons. The faculty includes 40 professors and 67 lecturers, assistants, etc., a total of 107. The curriculum embraces four years of eight and one-half months each. Three years of college work are required for admission. The total fees for each of the four years are, respectively, $175, $160, $154 and $155. The Dean is Dr. C. A. Hamann. The total registration for 1916–17 was 165; graduates, 32. The seventy-fifth session begins Sept. 27, 1917, and ends June 13, 1918.

### Columbus

OHIO STATE UNIVERSITY COLLEGE OF MEDICINE, Buttles Avenue and Park Street.—Organized in 1907 as the Starling-Ohio Medical College by the union of Starling Medical College (organized 1847) with the Ohio Medical University (organized 1890). In 1914 it became an integral part of the Ohio State University with its present title. The faculty consists of 30 professors and 61 lecturers, demonstrators, etc., a total of 91. *Two years* of collegiate work are required for admission. The course covers four years of eight months each. Tuition fees are $152 each year. The Dean is Dr. E. F. McCampbell. The total registration for 1916–17 was 142; graduates, 65. The next session begins Sept. 18, 1917, and ends June 18, 1918.

OHIO STATE UNIVERSITY COLLEGE OF HOMEOPATHIC MEDICINE.—Organized in 1914, when the property of the Cleveland-Pulte Medical College of Cleveland was transferred to the Ohio State University. The faculty numbers 26. *Two years* of college work are required for admission. The students are taught largely in the same classes and by the same teachers as students of the College of Medicine during the first two years. Tuition fees are $152 each year. The Dean is Dr. Claude A. Burrett. The total registration for 1916–17 was 36; graduates, 8. The third session begins Sept. 18, 1917, and ends June 18, 1918.

## OKLAHOMA

Oklahoma, population 2,114,307, has one medical college, the School of Medicine of the University of Oklahoma. The work of the first and second years is given in the academic laboratories at Norman, a city of 3,724 inhabitants. The work of the third and fourth years is given in Oklahoma City, which has a population of 88,158 and which is eighteen miles north of Norman.

To be eligible for license to practice medicine in Oklahoma, all students matriculating in 1914-15, in addition to a four-year high school education, must have completed at least one year of work in an approved college of liberal arts, including courses in physics, chemistry, biology and a modern language prior to beginning the study of medicine. For students matriculating in and after 1917-18, *two years* of preliminary college work will be required.

### Norman and Oklahoma City

UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE.—Organized in 1900. Gave only the first two years of the medical course at Norman until 1910, when a clinical department was established at Oklahoma City. It has a faculty of 49 professors and 17 instructors, a total of 66. *Two years* of collegiate work are required for admission. The course is four years of nine months each. An optional course of six years is offered for the degrees of B.S. and M.D. The total fees for the four years are, respectively, $43, $23, $25 and $25. The Dean is Dr. Leroy Long, 325 East Fourth Street, Oklahoma City. The total registration for 1916–17 was 85; graduates, 24. The eighteenth session begins Sept. 18, 1917, and ends June 4, 1918.

## OREGON

Oregon, population 809,490, has one medical college, the University of Oregon Medical School, located in Portland, a city of 272,833 population.

### Portland

UNIVERSITY OF OREGON MEDICAL SCHOOL, Lovejoy and Twenty-Third Streets.—Organized in 1887. The first class graduated in 1888. A class graduated each subsequent year except 1898. Became an integral part of the University of Oregon in 1910. The Willamette University Medical Department was merged in 1913. It has a faculty of 20 professors and 58 lecturers, assistants, etc., a total of 78. Entrance requirements are *two years* of college work or its equivalent. The course is four years of eight months each. Fees: Matriculation, $5; tuition, $150 each year. The Dean is Dr. K. A. J. Mackenzie. The total registration for 1916–17 was 72; graduates, 12. The thirty-first session begins Oct. 1, 1917, and ends June 1, 1918.

## PENNSYLVANIA

Pennsylvania, population 8,383,992, has six medical colleges. Of these, Philadelphia, having a population of 1,683,664, contains five, as follows: University of Pennsyl-

vania School of Medicine, Jefferson Medical College, Hahnemann Medical College and Hospital, Woman's Medical College of Pennsylvania and Temple University Department of Medicine. The other school, the School of Medicine of the University of Pittsburgh, is situated in Pittsburgh, a city of 571,984.

To be eligible for license to practice medicine in Pennsylvania, students matriculating in the session 1914-15 and thereafter, in addition to a four-year high school education, must have completed a year's work either in an approved college of liberal arts or in a preliminary year in the medical college, including college courses in physics, chemistry and biology, before beginning the study of medicine. He must also have completed an internship of at least one year in an approved hospital.

### Philadelphia

UNIVERSITY OF PENNSYLVANIA SCHOOL OF MEDICINE, Thirty-Sixth Street and Hamilton Walk.—Organized in 1765. Classes were graduated in 1768 and in all subsequent years except 1772-79, inclusive. The original title was the Department of Medicine, College of Philadelphia. The present title, School of Medicine of the University of Pennsylvania, was adopted in 1909. It granted the first medical diploma issued in America. In 1916 it took over the Medico-Chirurgical College of Philadelphia to develop it as a graduate school. The faculty consists of 86 professors, associate, adjunct and assistant professors, and 163 lecturers, associates, instructors, etc., a total of 249. The minimum requirements for admission are a standard four-year high school course or its equivalent, plus *two years* of work in an approved College of Arts and Science, including courses in French or German, and in physics, chemistry and general biology or zoology, with appropriate laboratory exercises. The course embraces four years of study of thirty-four weeks each. The total fees for each of the four years are, respectively, $233, $210, $210 and $214. The Dean is Dr. William Pepper. Total registration for 1916–17 was 585; these figures including 184 students who were formerly enrolled in the Medico-Chirurgical College, and of whom, 86 graduated. The one hundred and fifty-second session begins Sept. 28, 1917, and ends June 19, 1918.

JEFFERSON MEDICAL COLLEGE, Tenth and Walnut Streets.—Organized in 1825 with its present title as the Medical Department of Jefferson College, Canonsburg, Pa. Classes have been graduated annually since 1826. In 1838 a separate university charter was granted without change of title, since which time it has continued under the direction of its own board of trustees. It has a faculty of 25 professors, associate and assistant professors, and 132 associates, lecturers, demonstrators and instructors, a total of 157. Entrance requirements are a completed standard four-year high school or college preparatory course, or the equivalent, and in addition *two years* of work in an approved college of arts and science amounting to at least 60 semester hours, including specified courses in physics, chemistry and biology with laboratory work amounting to 8 semester hours each. The course of study covers graded work of four years of eight and a half months each. The tuition is $210 a year with a matriculation fee of $5 paid on admission. The Dean is Dr. Ross V. Patterson. The total registration for 1916–17 was 540; graduates, 140. The ninety-third session begins Sept. 24, 1917, and ends June 1, 1918.

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA, Twenty-First and N. College Avenue.—Organized in 1850. Classes were graduated in 1852 and in all subsequent years except 1862. It has a faculty of 11 professors and 50 assistants, lecturers, etc., in all 61. Entrance requirements are a completed course in a standard secondary school, and in addition *two years* of collegiate work, including courses in physics, chemistry, biology and two foreign languages, one of which must be French or German. The curriculum covers four years of eight months each. Fees for each of the four years are, respectively, $192, $176, $183 and $179.50. The acting Dean is Dr. Martha Tracy. The total registration for 1916–17 was 43; graduates, 17. The seventy-eighth session begins Sept. 19, 1917, and ends June 5, 1918.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL OF PHILADELPHIA, 226 North Broad Street.—Organized in 1848 as the Homeopathic Medical College of Pennsylvania. In 1869 it united with the Hahnemann Medical College of Philadelphia, taking the latter title. Assumed present title in 1885. The first class graduated in 1849. Entrance requirements are a completed course in a standard secondary school and in addition *two years* devoted to college courses including English and either French, German or Spanish, physics, chemistry and biology. It has a faculty of 55 professors and 31 lecturers, instructors, etc., in all 86. The work covers four years of eight and a half months each. Total fees for each of the first years are $185 and for the fourth year $200. The Dean is Dr. William A. Pearson. The total registration for the college year 1916–17 was 111; graduates, 37. The seventieth session begins Oct. 1, 1917, and ends June 6, 1918.

THE TEMPLE UNIVERSITY DEPARTMENT OF MEDICINE, Eighteenth and Buttonwood Streets.—Organized in 1901. The first class graduated in 1904. The faculty numbers 91. One year of college work is required for admission. The fees for each of the four years, respectively, are $175, $170, $160 and $161. The Dean is Dr. Frank C. Hammond. The total registration for 1916–17 was 83; graduates, 28. The seventeenth session begins Sept. 24, 1917, and ends June 15, 1918.

### Pittsburgh

UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE, Bigelow Boulevard.—Organized in 1886, as the Western Pennsylvania Medical College and in 1908 became an integral part of the University of Pittsburgh, removing to the university campus in 1910. The first class graduated in 1887. The faculty is composed of 15 professors and 93 associates, assistants, etc., 108 in all. Entrance requirements are *two years* of recognized college work, to have included essentially courses in English, chemistry (inorganic and organic), physics, biology and a reading knowledge of French or German, Italian or Spanish. It is possible for students to get the degree of B.S. and M.D. in six years. The course of study for medicine alone is four years of eight and a half months each. The tuition fee is $250 a year; matriculation fee, $15; diploma fee, $5. The Dean is Dr. Thomas S. Arbuthnot. The total registration for 1916–17 was 117; graduates, 20. The thirty-second session begins Oct. 1, 1917, and ends June 2, 1918.

## SOUTH CAROLINA

South Carolina, population 1,607,745, has one medical college, situated in Charleston, a city of 60,427 people.

Graduates of 1922 (matriculants of 1918-19) and thereafter, to be eligible for license to practice medicine in South Carolina must have completed, in addition to 14 units of high school work, *two years* in an approved college, including courses in English, physics, chemistry and biology.

### Charleston

THE MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA, Lucas and Calhoun Streets.—Organized in 1823 as the Medical College of South Carolina. The first class graduated in 1825. In 1832 a medical college bearing the present title was chartered and the two schools continued as separate institutions until they were merged in 1838. Classes were graduated in all years except 1862 to 1865, inclusive. In 1913, by legislative enactment, it became a state institution. It has a faculty of 32 professors and 27 lecturers, instructors, etc., a total of 59. The course covers four years of eight months each. *Two years* of collegiate work including courses in physics, chemistry, biology and a modern foreign language are required for admission, in addition to a standard high school preparation. The total fees are $150 for each of the first two years and $145 for each of the last two years. The Dean is Dr. Robert Wilson, Jr. Total enrolment for 1916–17 was 59; graduates, 24. The eighty-ninth session begins Sept. 28, 1917, and ends June 6, 1918.

## SOUTH DAKOTA

South Dakota, population 680,046, has one medical college, the University of South Dakota College of Medicine, located at Vermilion, a town of 2,187 people.

To be eligible for license to practice medicine in South Dakota, graduates of 1915 and thereafter must show that they matriculated in and graduated from medical colleges which required at least *two years* of collegiate work for admission, including courses in physics, chemistry, biology and a modern language. This affects all students who matriculated in the session of 1911-12 and therafter.

### Vermilion

UNIVERSITY OF SOUTH DAKOTA COLLEGE OF MEDICINE.—Organized in 1907. Offers only the first two years of the medical course. *Two years'* work in a college of liberal arts are required for admission. The fees are $60 each year. The faculty numbers 10. The Dean is Christian P. Lommen, B.S. The total registration for 1916–17 was 17. The eleventh session begins Sept. 20, 1917, and ends June 12, 1918.

## TENNESSEE

Tennesee, population 2,271,379, has four medical colleges. Of these Vanderbilt University Medical Department and Meharry Medical College are situated in Nashville, a city with a population of 115,978. The College of Medicine of the University of Tennessee and the University of West Tennessee College of Medicine and Surgery are located in Memphis, population 146,113.

To be eligible for a license to practice medicine in Tennessee students matriculating in the session of 1914-15 (graduates of 1918) and thereafter must have completed one year of collegiate work, including courses in physics, chemistry, biology and a modern language, in addition to a four-year high school course before entering on the study of medicine.

### Memphis

UNIVERSITY OF TENNESSEE COLLEGE OF MEDICINE, three buildings, 879 Madison Avenue.—Organized in 1876 at Nashville as Nashville Medical College. First class graduated 1877, and a class graduated each subsequent year. Became Medical Department of University of Tennessee 1879. In 1909 it united with the Medical Department of the University of Nashville to form the joint Medical Department of the Universities of Nashville and Tennessee. This union was dissolved in 1911. The trustees of the University of Nashville by formal action of that board named the University of Tennessee College of Medicine as its legal successor. In 1911 it moved to Memphis, where it united with the College of Physicians and Surgeons. The Memphis Hospital Medical College was merged in 1913. Lincoln Memorial University Medical Department was merged in 1914. The faculty includes 29 professors and 76 assistants, instructors, etc., a total of 105. Entrance requirements are a completed secondary education plus one year of collegiate work—*two years* of college work will be required in and after 1918. Students taking the two-year premedical course in Knoxville may secure the B.S. and M.D. degrees. The fees are $102 per year for bona fide residents of the state, and $152 per year for nonresidents; for the fourth year, $177. The Acting Dean is Dr. L. Junius Desha. Total registration for 1916–17 was 122; graduates, 58. The next session begins Sept. 22, 1917, and ends June 5, 1918.

UNIVERSITY OF WEST TENNESSEE COLLEGE OF MEDICINE AND SURGERY, Colored. 1190 South Phillips Place.—Organized in 1900. The first class

graduated in 1904, and a class graduated each subsequent year. It has a faculty of 24. The course covers four years. Two years of college work are required for admission. The fees are $60 per year; graduation, $10 extra. The Dean is Dr. M. V. Lynk. Registration for 1916–17 was 20; graduates, 4. The eighteenth session begins Sept. 17, 1917, and ends May 7, 1918. *Official reports indicate that the diplomas of this college are not recognized as an acceptable qualification for the license by the licensing boards of thirty-nine states.*

### Nashville

VANDERBILT UNIVERSITY MEDICAL DEPARTMENT.—This school was founded in 1874. The first class graduated in 1875. The faculty consists of 25 professors and 59 lecturers, a total of 84. One year of collegiate work is required for admission. The course covers four years of nearly eight and a half months each. The total fees for each of the first three years are $150, and for the fourth year, $175. The Dean is Dr. L. E. Burch. The total registration for 1916–17 was 152; graduates, 75. The forty-fourth session begins Oct. 1, 1917, and ends June 12, 1918.

MEHARRY MEDICAL COLLEGE. Colored. First Avenue, South, and Chestnut Street.—This school was organized in 1876 as the Medical Department of Central Tennessee College, which became Walden University in 1900. First class graduated in 1877. Obtained new charter independent of Walden University in 1916. The faculty is made up of 13 professors and 12 instructors, demonstrators, etc., 25 in all. The work embraces four years of thirty weeks each. The total fees for each of the first three years are $70 and for the fourth year, $80. The President is Dr. G. W. Hubbard. Total registration for 1916-17 was 255; graduates, 96. The forty-second session begins Sept. 25, 1917, and ends May 9, 1918.

## TEXAS

Texas, population 4,343,710, has three medical colleges. The University of Texas Department of Medicine is located at Galveston, a city of 41,076 inhabitants. The Fort Worth School of Medicine is at Forth Worth, population 99,528. The Baylor University College of Medicine is located in Dallas, population 118,482.

To be eligible for a license to practice medicine in Texas, students matriculating in the session of 1914-15 and thereafter must have completed a year of collegiate work, including courses of physics, chemistry, biology and a modern language, in addition to a standard four-year high school course, before entering on the study of medicine.

### Dallas

BAYLOR UNIVERSITY COLLEGE OF MEDICINE, 720 College Avenue.—Organized in 1900 as the University of Dallas Medical Department. In 1903 it took its present name and became the Medical Department of Baylor University at Waco. It acquired the charter of Dallas Medical College in 1904. The first class graduated in 1901. The faculty numbers 54. Entrance requirement is one year of college work in addition to a four-year high school education. For the session of 1918–19 and thereafter *two years* of collegiate work will be required for admission. The course is four years of eight months each. The fees are $115 each year; matriculation fee of $5, paid but once; graduation fee, $25. The Dean is Dr. E. H. Cary. Total registration for 1916–17 was 45; graduates, 11. The eighteenth session begins Oct. 1, 1917, and ends May 31, 1918.

### Fort Worth

FORT WORTH SCHOOL OF MEDICINE, Medical Department of Texas Christian University, Calhoun and Fifth Streets.—Organized in 1894 as the Fort Worth School of Medicine. It was the Medical Department of the Fort Worth University until 1911, when it was affiliated with Texas Christian University. The first class graduated in 1895. Its faculty consists of 28 professors and 40 instructors, assistants, etc., a total of 68. A combined scientific and medical course of six years' duration is offered. The two degrees of A.B. and M.D. are conferred simultaneously at the end of the sixth year. All students entering after Jan. 1, 1918, will be required to conform to the six-year course. The total fees for the four years, respectively, are $115, $125, $115 and $110. The Dean is Dr. Samuel A. Woodward. The total registration for 1916–17 was 55; graduates, 17. The twenty-fourth session begins Oct. 1, 1917, and ends June 8, 1918.

### Galveston

UNIVERSITY OF TEXAS DEPARTMENT OF MEDICINE, on the Strand, between Ninth and Tenth Streets.—Organized in 1891. The first class graduated in 1892. It has a faculty of 18 professors and 23 lecturers, a total of 41. The curriculum embraces four years of eight months each. The entrance requirement is *two years* of collegiate work in addition to a four-year high school education. The total fees for the four years, respectively, are $77.25, $47.25, $29.75 and $17.25. The Dean is Dr. William S. Carter. Total registration for 1916–17 was 255; graduates, 50. The twenty-seventh session begins Oct. 1, 1917, and ends May 31, 1918.

## UTAH

Utah, population 424,300, has one medical college, the School of Medicine of the University of Utah, situated at Salt Lake City, which has 113,567 people.

To be eligible to secure licenses to practice medicine in Utah, students matriculating in and after the session of 1912-13, in addition to a four-year high school education, must have completed at least one year of collegiate work prior to beginning the study of medicine, this preliminary college work to have included college courses in physics, chemistry and biology.

### Salt Lake City

UNIVERSITY OF UTAH SCHOOL OF MEDICINE.—Organized in 1906. Gives only first two years of medical course. Each course covers thirty-six weeks. *Two years* of collegiate work are required for admission. The medical faculty consists of 10 professors and 13 lecturers and assistants, a total of 23. The fees are $100 each year for residents, and $125 each year for nonresidents. The Dean is Dr. Perry G. Snow. Total registration for 1916–17 was 22. The eleventh session begins Sept. 13, 1917, and ends June 7, 1918.

## VERMONT

Vermont, population 362,452, has one medical school, located at Burlington, a town of 21,432 people.

Students matriculating in and after the session of 1912-13 who desire to practice medicine in Vermont must have obtained a preliminary training of at least one year of collegiate work in addition to a standard four-year high school education, this additional year's work to include college courses in physics, chemistry and biology.

### Burlington

UNIVERSITY OF VERMONT COLLEGE OF MEDICINE, Pearl Street, College Park.—Organized with complete course in 1822. Classes graduated in 1823 to 1836, inclusive, when the school was suspended. It was reorganized in 1853 and classes were graduated in 1854 and in all subsequent years. The faculty numbers 37. One year of college work in addition to a four-year high school education is required for admission. The course of study covers four years of nine months each. The total fees for each of the first three years are $145, and $170 for the fourth year. The Dean is Dr. H. C. Tinkham. The total registration for 1916–17 was 82; graduates, 18. The next session begins Sept. 6, 1917, and ends June 26, 1918.

## VIRGINIA

Virginia, population 2,171,014, has two medical colleges, one the Department of Medicine of the University of Virginia, situated in Charlottesville, population 6,765, and the Medical College of Virginia at Richmond, population 154,674.

Only graduates of medical colleges registered by the Virginia State Board of Medical Examiners are eligible to obtain licenses to practice medicine in this state. Medical colleges to be so registered must require of all students admitted in the session of 1914-15, completion of at least one year, and in the session of 1917-18 and thereafter *two years* of collegiate work, including courses in physics, chemistry, biology and a modern language, preferably German, in addition to a four-year high school education.

### Charlottesville

UNIVERSITY OF VIRGINIA DEPARTMENT OF MEDICINE.—Organized in 1827. Classes were graduated in 1828 and in all subsequent years except 1865. It has a faculty of 16 professors and 20 lecturers, instructors, assistants, etc., a total of 36. The requirements for admission are the completion of a four-year high school course, or its equivalent, and *two years* of college work devoted to English, mathematics, chemistry, physics and biology, and French or German. Total fees for each year are $140; matriculation fee, $10. The Dean is Dr. Theodore Hough. The total registration for 1916–17 was 108; graduates, 23. The eighty-ninth session begins Sept. 13, 1917, and ends June 12, 1918.

### Richmond

MEDICAL COLLEGE OF VIRGINIA, Marshall and College Streets.—Organized in 1838 as the Medical Department of Hampden Sydney College. Present title was taken in 1854. In 1913 the University College of Medicine was merged. In 1914 the North Carolina Medical College was merged. Classes were graduated in 1840 and in all subsequent years. It has a faculty of 44 professors and 88 lecturers, instructors, etc., a total of 132. The requirement for admission is a four-year high school education and in addition *two years* of collegiate work, including courses in physics, chemistry, biology and French or German. The course embraces four years of eight months each. Fees, $170 for each of the first three years and $200 for the fourth. The Dean is Dr. Stuart McGuire. The total registration for 1916–17 was 227; graduates, 113, including 21 students of the North Carolina Medical College and 17 who were granted degrees by the latter. The eighty-ninth session begins Sept. 18, 1917, and ends June 4, 1918.

## WEST VIRGINIA

West Virginia, population 1,359,474, has one medical college, the School of Medicine of West Virginia University, which offers the first two years of the medical course. It is located at Morgantown, a city of 12,974 population.

Graduates of 1921 (matriculants of 1917-18) and thereafter, in order to secure licenses to practice medicine in West Virginia, must have completed, in addition to a high school education, one year of collegiate work, including courses in physics, chemistry and biology, before entering on the study of medicine.

### Morgantown

WEST VIRGINIA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1902, and gives only the first two years of the medical course. *Two years* of college work are required for admission and the Bachelor's degree will be granted to those who finish the two years in medicine. Session extends through nine months. The faculty numbers 15. Fees: For residents of the state, $25 each year; for nonresidents, $50; matriculation fee, $10. The Dean is Dr. John N. Simpson. The total registration for 1916–17 was 34. The next session begins Sept. 17, 1917, and ends June 12, 1918.

## WISCONSIN

Wisconsin, population 2,473,533, has two medical colleges, the Medical School of the University of Wisconsin, which teaches the first two years of the medical course, and is located at Madison, a city of 30,084 people, and the Marquette University School of Medicine, located at Milwaukee, a city of 428,062 people.

To be eligible for licenses to practice medicine in Wisconsin, students matriculating in the session of 1915-16 (graduates of 1919) and thereafter, prior to entering a medical school, must have completed, besides a four-year high school course, *two years* of collegiate work, including courses in physics, chemistry, biology and a modern language.

### Madison

UNIVERSITY OF WISCONSIN MEDICAL SCHOOL.—Organized in 1907. Gives only the first two years of the medical course. For matriculation at least *two years* in a college of arts and science or an equivalent training are required, including two years of Latin, a reading knowledge of French or German, and at least a year's work in physics, chemistry and biology. It has a faculty of 15 professors and 17 lecturers, instructors, etc., a total of 32. Tuition fees: For residents of the state, $70 each year; for nonresidents, $194. The Dean is Dr. Charles R. Bardeen. The registration for 1916–17 was 132. The tenth session begins Sept. 24, 1917, and ends June 26, 1918.

### Milwaukee

MARQUETTE UNIVERSITY SCHOOL OF MEDICINE, Fourth Street and Reservoir Avenue.—Organized in December, 1912, by the merger of the Milwaukee Medical College and the Wisconsin College of Physicians and Surgeons. It has a faculty of 9 professors and 92 assistants, instructors, etc., a total of 101. The entrance requirements include, in addition to a four-year high school education, *two years* of college work, including courses in physics, chemistry, biology and a modern language. The curriculum is for four years of thirty-four weeks each. The total fees for the four years, respectively, are $175, $170, $170 and $195. The Dean is Dr. Louis F. Jermain. The registration for 1916–17 was 57; graduates, 13. The sixth session begins Sept. 13, 1917, and ends June 14, 1918.

## CANADA

The Dominion of Canada has nine medical colleges, all but one of which require a five-year course, including in the first year courses in physics, chemistry and biology. This course is practically equal to that in the colleges of the United States which require one year of college work for admission, including the science courses named. None of the Canadian colleges has a minimum requirement of two years of collegiate work, or its equivalent, preliminary to or as a part of the medical course. The medical school at Edmonton, Alberta, gives only the first two years of the medical course, or three years including the preliminary science year.

### Alberta

UNIVERSITY OF ALBERTA, FACULTY OF MEDICINE, Edmonton.—Organized in 1913. Offers only the first three years of the five-year medical course, including the preliminary science year. The faculty numbers 15. Fees for the first year are $62; for the second and third years, each $87. The registrar is Cecil E. Race, B.A. The registration for 1916–17 was 33. The fifth session begins Oct. 1, 1917, and ends May 16, 1918.

### Manitoba

MANITOBA MEDICAL COLLEGE, Winnipeg.—It is the Medical Faculty of the University of Manitoba. Organized in 1883, first class graduated in 1886 and a class graduated each subsequent year. The faculty numbers 58. The fees are $170 for the first year and $155 for each subsequent year. The entire course covers five years, the first year including premedical courses in physics, chemistry and biology. The Dean is Dr. S. Willis Prowse. Total registration for 1916–17 was 120; graduates, 32. The next session begins Sept. 25, 1917, and ends May 11, 1918. War session began May 1, 1917, and will end Nov. 30, 1917.

### Nova Scotia

DALHOUSIE UNIVERSITY, FACULTY OF MEDICINE, Halifax, N. S.—Organized in 1867. Incorporated as the Halifax Medical College in 1875. Reorganized as an examining faculty, separate from the Halifax Medical College in 1855. In 1911, in accordance with an agreement between the Governors of Dalhousie University and the Corporation of the Halifax Medical College, the work of the latter institution was discontinued and a full teaching faculty was established by the University. By an arrangement between Dalhousie University and the Provincial Medical Board of Nova Scotia, the final professional examinations are conducted conjointly by the university and the board, and candidates may qualify at the same time for their academic degrees and the provincial license. First class graduated in 1872. It has a faculty of 30 professors, lecturers and demonstrators. Requires matriculation examination and a graded course of five years, including premedical courses in physics, chemistry and biology. The fees are $100 for each of the first two years and $110 for each of the other three. Total registration for 1916–17 was 71; graduates, 14. The Secretary is Prof. D. Fraser Harris. The next session begins Sept. 25, 1917, and ends May 30, 1918.

### Ontario

UNIVERSITY OF TORONTO, FACULTY OF MEDICINE, Toronto.—Organized in 1843 as the Medical Faculty of King's College. Abolished in 1853. Reestablished in 1887. In 1902 it absorbed Victoria University, Medical Department, and in 1903 absorbed Trinity Medical College. The course of study covers five years of eight months each, the first year including premedical courses in physics, chemistry and biology. It has a faculty of 49 professors and 152 lecturers, associates, etc., a total of 201. The fees are $150 each year; graduation fee, $20. The Secretary is Dr. A. Primrose. The total registration for 1916–17 was 470; graduates, 100. The next session begins Sept. 25, 1917, and ends June 1, 1918.

QUEEN'S UNIVERSITY FACULTY OF MEDICINE, Kingston.—Organized 1854, first class graduated in 1855, and a class graduated each subsequent year. The faculty was originally a department of the university, but a separation took place in 1866, when the school was conducted under the charter of the Royal College of Physicians and Surgeons at Kingston. In 1892 the school again became an integral part of Queen's University. The faculty includes 17 professors and 25 assistants, instructors, etc., a total of 42. The fees amount to $115 each year; fee for M.D., C.M. degrees, $30. The course covers five years of thirty teaching weeks each, the first year including courses in physics, chemistry and biology. The total registration in 1916–17 was 277; graduates, 56. The Dean is Dr. J. C. Connell. The next session begins Sept. 26, 1917, and ends May 29, 1918.

WESTERN UNIVERSITY, FACULTY OF MEDICINE, London.—Organized in 1881, first class graduated in 1883, and a class graduated each year subsequently. The Faculty of Medicine became an integral part of Western University in 1913. The faculty numbers 57. The course is five years of eight months each, the first year including premedical courses in physics, chemistry and biology. The total fees each year are $115; matriculation fee, $5; graduation fee, $25. The Dean is Dr. H. A. McCallum. Total registration for 1916–17 was 71; graduates, 14. The next session begins Oct. 1, 1917, and ends May 31, 1918.

### Montreal

MCGILL UNIVERSITY, FACULTY OF MEDICINE.—Founded 1824 as Montreal Medical Institution; became the Medical Faculty of McGill University in 1829; first class graduated under the university auspices in 1833. No session between 1836–39 owing to political troubles. In 1905 it absorbed the Faculty of Medicine of the University of Bishop College. The course extends over five years of eight months each, including the preliminary year devoted largely to physics, chemistry and biology. The faculty numbers 131. The total fees for the five years, respectively, are $174, $174, $181, $174 and $204. The total registration for 1916–17 was 335; graduates, 63. The Registrar is Dr. John W. Scane. The next session begins Oct. 3, 1917, and ends May 24, 1918.

MONTREAL SCHOOL OF MEDICINE AND SURGERY, Montreal.—Organized in 1843, incorporated in 1845. In 1891, by act of parliament, the Medical Faculty of Laval University (organized in 1878) was absorbed. Present name assumed in 1911. A class was graduated in 1843 and in each subsequent year. The faculty numbers 75. The course extends over five years, including premedical courses in physics, chemistry and biology. The total fees for the five years, respectively, are $110, $118, $126, $126 and $138. The Dean is Dr. E. P. Lachapelle. The total registration for 1916–17 was 192; graduates, 29. The next session begins Oct. 3, 1917, and ends June 30, 1918.

### Quebec

LAVAL UNIVERSITY FACULTY OF MEDICINE, Quebec.—The Quebec School of Medicine, organized in 1848, became in 1852 the Medical Department of Laval University; first class graduated in 1855, and a class graduated each subsequent year. The faculty numbers 29. The fees are $75 each year. The course extends over five years, the first year including courses in physics, chemistry and biology. The Dean is Dr. Edwin Turcot, Quebec. Total registration for 1916–17 was 87; graduates, 7. The next session begins Sept. 18, 1917, and ends June 1, 1918.

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## FOREIGN MEDICAL COLLEGES

This list has been prepared from data collected by the Council on Medical Education.

ARGENTINE REPUBLIC

*Buenos Ayres.*—Universidad Nacional de Buenos Aires.
*Cordova.*—Universidad Nacional.

AUSTRALIA

*Adelaide*—University of Adelaide.
*Melbourne.*—University of Melbourne.
*Perth.*—University of Perth.
*Sydney.*—University of Sydney.

AUSTRIA

*Graz, Styria.*—K. K. Karl Franzens Universität.
*Innsbruck, Tyrol.*—K. K. Leopold Franzens Universität.
*Krakow, Galicia.*—C. K. Uniwersytet Jagiellonski w Krakowie.
*Lemberg, Galicia.*—C. K. Uniwersytet Imienia Cesarza Franciszka I.
*Prague, Bohemia.*—K. K. Deutsche Karl Ferdinands Universität.
*Prague, Bohemia.*—C. K. Ceská Universita Karlo-Ferdinandova.
*Vienna, Nether Austria.*—K. K. Universität.

BELGIUM

*Brussels.*—Université Libre de Bruxelles.
*Ghent.*—Université de l'Etat de Gand.
*Liege.*—Université de Liège.
*Louvain.*—Université Catholique.

BOLIVIA

*La Paz.*—Universidad de La Paz.
*Sucre.*—Universidad de Sucre.

BRAZIL

*Bahia.*—Faculdade de Medicina, Cirurgia e Pharmacia.
*Porto Allegre.*—Faculdade Livre de Medicina e Pharmacia.
*Rio de Janeiro.*—Faculdade de Medicina, Cirurgia e Pharmacia.

CANADA

*Edmonton, Alberta.*—University of Alberta, Faculty of Medicine.
*Halifax, Nova Scotia.*—Dalhousie University.
*Kingston, Ontario.*—Queen's University.
*London, Ontario.*—Western University.
*Montreal, Quebec.*—McGill University.
*Montreal, Quebec.*—Montreal School of Medicine.
*Quebec, Quebec.*—Université Laval.
*Toronto, Ontario.*—University of Toronto.
*Winnipeg, Manitoba.*—University of Manitoba (Manitoba Medical College).

CHILE

*Santiago.*—Universidad de Chile.

CHINA

City Province College

*Canton, Kwangtung.*—Chung-fa Medical College.
*Canton, Kwangtung.*—Hackett Medical College (Women).
*Canton, Kwangtung.*—Kung Yee Medical College.
*Canton, Kwangtung.*—Kwangtung Provincial Medical College.
*Canton, Kwangtung.*—Kwang Wa Medical College.
*Canton, Kwangtung.*—Liang Yueh Medical College.
*Changsha, Hunan.*—Hunan-Yale College of Medicine.*
*Chengtu, Szechuan.*—West China Christian University School of Medicine.
*Foochow, Fukien.*—Union Medical College.
*Hangchow, Chekiang.*—Chekiang Provincial Medical College.
*Hangchow, Chekiang.*—Hangchow Medical Training College.
*Hankow, Hupeh.*—Union Medical College.
*Hongkong, Hongkong.*—Hongkong University School of Medicine
*Mukden, Manchuria.*—Mukden Medical College.*
*Mukden, Manchuria.*—South Manchuria Medical College.
*Peking, Chihli.*—Board of Education Medical College.
*Peking, Chihli.*—Union Medical College.*
*Peking, Chihli.*—Union Medical College for Women.
*Shanghai, Kiangsu.*—German School of Medicine.
*Shanghai, Kiangsu.*—Pennsylvania St. John's Medical School.*
*Soochow, Kiangsu.*—Elizabeth Blake Medical Training College.
*Soochow, Kiangsu.*—Kiangsu Provincial Medical College.
*Soochow, Kiangsu.*—Woman's Medical College.
*Tientsin, Chihli.*—Army Medical College.
*Tientsin, Chihli*—Navy Medical College.
*Tsinanfu, Shantung.*—Shantung Christian University School of Medicine.*

The five colleges indicated by an asterisk (*) are eligible to membership in the Association of Medical Colleges of China. Membership in that association is limited to such colleges as provide a four-year medical course, preceded by adequate college courses, with laboratory work, in physics, chemistry and biology, based on high school graduation.

COLOMBIA

*Bogota.*—Universidad de Bogota.

CUBA

*Havana.*—Universidad de la Habana.

DENMARK

*Copenhagen.*—Kjobenhavns Universitet.

ECUADOR

*Quito.*—Universidad Central de Ecuador.

EGYPT

*Cairo.*—Kasr il Aini (School of Medicine).

ENGLAND

*Birmingham*—University of Birmingham.
*Bristol.*—University of Bristol.
*Cambridge.*—University of Cambridge.
*Durham.*—Durham University (Durham College of Medicine).
*Leeds.*—University of Leeds.
*Liverpool.*—University of Liverpool.
*London.*—University of London (including the following Medical Schools: (*a*) St. Bartholomew's Hospital, (*b*) Charing Cross Hospital, (*c*) St. George's Hospital, (*d*) Guy's Hospital, (*e*) King's College, (*f*) London Hospital, (*g*) St. Mary's Hospital, (*h*) Middlesex Hospital, (*i*) St. Thomas Hospital, (*j*) University College, (*k*) Westminster Hospital, and (*l*) Royal Free Hospital (School of Medicine for Women).
*Manchester.*—Victoria University (Owen's College, founded in 1851, was merged into Victoria University in 1905).
*Oxford.*—University of Oxford.
*Sheffield.*—University of Sheffield.

FRANCE

*Faculties of Medicine* (to degree of doctor in medicine, including the five required examinations).
*Bordeaux.*—Université de Bordeaux.
*Lille.*—Université de Lille.
*Lyons.*—Université de Lyon.
*Montpelier.*—Université de Montpelier.
*Nancy.*—Université de Nancy.
*Paris.*—Université de Paris.
*Toulouse.*—Université de Toulouse.
*Preparatory Schools of Medicine.*—Graduates of the 16 following schools are allowed to take the first two examinations if they are presided over by some member of a medical faculty:
(*a*) *"Full Exercise,"* or complete course (covering the work of 16 trimesters).
*Algiers (Africa).*—Académie d'Alger.
*Marseilles.*—Université d'Aix Marseille.
*Nantes.*—Ecole de Plein Exercice de Médecine et de Pharmacie (part of the University of Rennes).
*Rennes.*—Université de Rennes.
(*b*) *Reorganized Schools.*—(Completing the first 12 trimesters).
*Amiens.*—Ecole Préparatoire de Médecine et de Pharmacie (part of the University of Lille).
*Angers.*—Ecole Préparatoire de Médecine et de Pharmacie (part of the University of Rennes).
*Besancon.*—Université de Besancon.
*Caen.*—Université de Caen.
*Clermont.*—Université de Clermont.
*Dijon.*—Université de Dijon.
*Grenoble.*—Université de Grenoble.
*Limoges.*—Ecole de Médecine et de Pharmacie (part of the University of Poitiers).
*Poitiers.*—Université de Poitiers.
*Reims.*—Ecole Préparatoire de Médecine et de Pharmacie (part of the University of Paris).
*Rouen.*—Ecole de Médecine et de Pharmacie (part of the University of Caen).
*Tours.*—Ecole Préparatoire de Médecine et de Pharmacie (part of the University of Poitiers).

GERMANY

*Berlin, Prussia.*—Königliche Friedrich-Wilhelm Universität.
*Bonn, Prussia.*—Rheinische Friedrich-Wilhelms-Universität.
*Breslau, Prussia.*—Königliche Universität.
*Erlangen, Bavaria.*—Königliche Friedrich-Alexanders Universität.
*Freiberg, Baden.*—Grossherzogliche Badische Albert-Ludwigs-Universität.
*Giessen, Hesse.*—Grossherzogliche Hessische Ludwigs-Universität.
*Gottingen, Prussia.*—Königliche Georg-August-Universität.
*Greifswald, Prussia.*—Königliche Universität.
*Halle, Prussia.*—Vereinigte Friedrichs-Universität, Halle-Wittenberg.
*Heidelberg, Baden.*—Grossherzogliche Ruprecht-Karls-Universität.
*Jena, Thuringia.*—Grossherzogliche und Herzogliche Sächsiche Gesamt. Universität.
*Kiel, Prussia.*—Königliche Christian-Albrechts-Universität.
*Königsberg, Prussia.*—Königliche Albertus-Universität.
*Leipzig, Saxony.*—Universität.
*Marburg, Prussia.*—Universität.
*Munich, Bavaria.*—Königliche Bayr. Ludwig-Maximilians-Universität.
*Rostock, Mecklenburg.*—Universität.
*Strassburg, Alsace-Lorraine.*—Kaiser-Wilhelms-Universität.
*Tübingen, Wurtemberg.*—Königliche Eberhard-Karls-Universität.
*Würzberg, Bavaria.*—Königliche Julius-Maximilians Universität.

GREECE

*Athens.*—National University.

GUATEMALA

*Guatemala.*—Facultad de Medicina.

HAITI

*Port au Prince.*—L'Ecole Nationale de Médecine.

HONDURAS

*Tegucigalpa.*—Facultad de Medicina.

HUNGARY

*Budapest.*—Budapesti Királyi Magyar Tudomány-Egyetem (Royal Hungarian University).
*Klausenburg.*—Kolozsvári Magyar Királyi Ferencz-József Tudomány-Egyetem (Royal Hungarian Franz-Joseph University).
*Pressburg.*—Royal Hungarian University.

ICELAND

*Reykjavik.*—Loeknaskoli (School of Physicians).

INDIA

*Bombay.*—University of Bombay (Grant Medical College).
*Calcutta.*—Belgachia Medical College. This is said to be a "private enterprise, managed entirely by Bengali medical men." It is affiliated with and holds the same educational standards as the medical school of the University of Calcutta.
*Calcutta.*—University of Calcutta (Medical College of Bengal)
*Lahore*—Punjab University (Lahore Medical College).
*Lucknow.*—King George's Medical College.
*Madras.*—University of Madras (Madras Medical College).
*Ceylon (Columbo).*—The Ceylon Medical College.
*Note.*—The colleges named above are accredited by the examining board in England. Minor medical colleges, which it is understood are not so accredited, are located at Agra, Ahmedabad, Dacca, Dibragarh, Hyderabad, Lahore, Poona, Rangoon, Rayapuram, Tanjore and Vizagapatam. At the beginning of the present year (1916) the first college for women in India, known as the Hardinge Women's Medical College, was opened at Delhi.

IRELAND

*Belfast.*—Queen's University.
*Dublin.*—National University of Ireland (including University College, Dublin; University College, Cork; University Cóllege, Galway).
*Dublin.*—University of Dublin (The School of Physic in Ireland, Trinity College; Catholic University Medical School).
*Dublin.*—Royal College of Surgeons in Ireland Schools of Surgery (including the Carmichael College of Medicine and the Ledwich School of Medicine).

ITALY

*Bologna.*—Regia Università degli Studi.
*Caghari, Sardinia.*—Università degli Studi.
*Camerino.*—Libera Università degli Studi. Gives only the first four years of the six-year medical course and does not grant degrees.
*Catania.*—Regia Università degli Studi di Catania.

*Ferrara.*—Libera Università degli Studi di Ferrara.
*Florence.*—Regia Instituto di Studi Superiori, Practici e di Perfezionamento.
*Genoa.*—Regia Università degli Studi.
*Messina.*—Regia Università degli Studi.
*Modena.*—Regia Università degli Studi.
*Naples.*—Regia Università degli Studi.
*Padua.*—Regia Università degli Studi.
*Palermo.*—Regia Università degli Studi.
*Parma.*—Regia Università degli Studi.
*Pavia.*—Regia Università degli Studi.
*Perugia.*—Università Libra degli Studi.
*Pisa.*—Regia Università degli Studi.
*Rome.*—Regia Università degli Studi.
*Sassari.*—Regia Università degli Studi.
*Siena.*—Regia Università degli Studi.
*Turin.*—Regia Università degli Studi.

JAPAN

*Chiba.*—Chiba Special Medical School.
*Fukuoka.*—Kyushu Imperial University, Medical College. (Formerly a part of Kyoto Imperial University.)
*Kanazawa.*—Kanazawa Special Medical School.
*Kumamota.*—Kumamota Special Medical School.
*Kyoto.*—Kyoto Imperial University, Medical College.[1]
*Kyoto.*—Kyoto Prefecture, Special Medical School.
*Mukden.*—South Manchuria Medical School.
*Nagasaki.*—Nagasaki Special Medical School.
*Nagoya.*—Aichi Prefecture, Special Medical School.
*Niigata.*—Niigata Special Medical School.
*Okayama.*—Okayama Special Medical School.
*Osaka.*—Osaka Prefecture, Higher Medical School.[1]
*Sendai.*—Tohoku Imperial University, Medical College.[1]
*Sendai.*—Tohoku Imperial University, Special Medical Department. (This is a reorganization of the old Sendai Special Medical School. Made a part of Tohoku Imperial University in March, 1912, under the name of Special Medical Department.)
*Tansui,* Taiwan.—Taiwan (Formosa) Medical School.[2]
*Tokyo.*—Nippon Special Medical School.[3]
*Tokyo.*—Sai Sai Medical College (Extinct August, 1903).
*Tokyo.*—Tokyo Charity Hospital Special Medical School.
*Tokyo.*—Tokyo Imperial University, Medical College.[1]
*Tokyo.*—Tokyo Woman's Special Medical School.[3]

1. For admission require graduation from the "Third Department of the Higher Schools," which covers three years of premedical training following graduation from the Middle Schools.
2. A medical school conducted by the Japanese Government, primarily for the aborigines of Taiwan (Formosa). Only a common school education required for admission. Graduates licensed to practice in Tansui only.
3. Graduates not licensed by the Japanese Government unless they pass a special examination.

JAVA

*Batavia.*—Schoot Tot Opleiding van Inl. Artsen.

KOREA

*Seoul.*—Union Medical School.

MADAGASCAR

*Tananarive.*—L'Ecole de Médecine.

MALAYA

*Singapore.*—Malaya Medical School.

MEXICO

*Guadalajara.*—Escuela de Medicina y de Farmacia de Jalisco.
*Mexico.*—Escuela Nacional de Medicina.
*Monterey.*—Escuela de Medicine de Nuovo Leon.

NETHERLANDS

*Amsterdam.*—Universiteit van Amsterdam.
*Groningen.*—Rijks-Universiteit te Groningen.
*Leyden.*—Rijks-Universiteit.
*Utrecht.*—Rijks-Universiteit.

NEW ZEALAND

*Wellington.*—University of New Zealand (affiliated with the University of Cambridge, England).

NICARAGUA

*Leon.*—Universidad de Nicaragua.

NORWAY

*Christiania.*—Kongelige Frederiks Universitet.

PERSIA

*Urumia.*—Urumia College Medical Department.

PERU

*Lima.*—Universidad Mayor de San Marcos.

PORTUGAL

*Coimbra.*—Universidade de Coimbra.
*Lisbon.*—Escola Medico-Cirurgica.
*Oporto.*—Escola Medico-Cirurgica.

ROUMANIA

*Bukharest.*—Universitatea din Bucuresti.
*Jassy.*—Universitatea din Jasi.

RUSSIA

*Helsingfors, Finland.*—Kejserliga Alexanders Universitet.
*Jurjev (formerly Dorpat).*—Imperatorski Jurjevskij Universitet.
*Kazan.*—Imperatorskij Kasanskij Universitet.
*Kharkov.*—Imperatorskij Charkovskij Universitet.
*Kief.*—Imperatorskij Universitet Sv. Vladimira.
*Moscow.*—Imperatorskij Moskovskii Universitet.
*Odessa.*—Imperatorskij Novorossijskij Universitet.
*Tomsk, Siberia.*—Tomskij Universitet.
*Warsaw.*—Imperatorskij Varsavskij Universitet.

SANTO DOMINGO

*Santo Domingo.*—University of Santo Domingo.

SCOTLAND

*Aberdeen.*—University of Aberdeen.
*Dundee.*—University of St. Andrews (University College).
*Edinburgh.*—University of Edinburgh.
*Edinburgh.*—School of Medicine of the Royal Colleges (including the Surgeons' Hall School).
*Glasgow.*—University of Glasgow (including Queen Margaret College).
*Glasgow.*—Anderson's College Medical School.
*Glasgow.*—St. Mungo's College and Glasgow Royal Infirmary.
*Glasgow.*—Western Medical School.

SIAM

*Bangkok.*—Royal Medical College.

SOUTH AFRICA

*Cape Town.*—South African Medical College.

SPAIN

*Barcelona.*—Universidad de Barcelona.
*Cadiz.*—Facultad de Medicina.
*Granada.*—Universidad de Granada.
*Madrid.*—Universidad de Central de Espana.
*Santiago.*—Universidad.
*Saragossa.*—Universidad.
*Seville.*—Universidad de Sevilla. (To this university also belongs the Medical Faculty at Cadiz.)
*Valencia.*—Universidad.
*Valladolid.*—Universidad.

SWEDEN

*Lund.*—Kungl. Karolinska Universitetet.
*Stockholm.*—Karolinska Institutet (Medico-Chirurgical Institute). (This institute has the same chancellor as the universities at Lund and Upsala, and is guided by a similar constitution.)
*Upsala.*—Kungl. Universitetet i Upsala.

SWITZERLAND

*Basel.*—Universität.
*Berne.*—Kantonale Universität.
*Fribourg.*—Universität.
*Geneva.*—Université de Genève.
*Lausanne.*—Université.
*Neu-Chatel.*—Universität.
*Zurich.*—Universität.

SYRIA

*Beirut.*—Syrian Protestant College.
*Beirut.*—Université Saint Joseph de Beyrouth.

TURKEY

*Constantinople.*—University of Constantinople. (Another medical department of this university is located at Damascus.)

URUGUAY

*Montevideo.*—Universidad.

VENEZUELA

*Caracas.*—Universidad Central de Venezuela.

WALES

*Cardiff.*—University of Wales (Cardiff School of Medicine). (Gives only the first three years of the medical course.)

## MEDICAL COLLEGES OF THE WORLD

| Nation. | Colleges | Nation. | Colleges |
|---|---|---|---|
| Argentine | 2 | Java | 1 |
| Australia | 4 | Korea | 1 |
| Austria | 7 | Madagascar | 1 |
| Belgium | 4 | Malaya | 1 |
| Bolivia | 2 | Mexico | 3 |
| Brazil | 3 | Netherlands | 4 |
| Canada | 9 | New Zealand | 1 |
| Chile | 1 | Nicaragua | 1 |
| China | 26 | Norway | 1 |
| Colombia | 1 | Persia | 1 |
| Cuba | 1 | Peru | 1 |
| Denmark | 1 | Portugal | 3 |
| Ecuador | 1 | Roumania | 2 |
| Egypt | 1 | Russia | 9 |
| England | 21 | Santo Domingo | 1 |
| France | 7 | Scotland | 8 |
| Germany | 20 | Siam | 1 |
| Greece | 1 | South Africa | 1 |
| Guatemala | 1 | Spain | 9 |
| Haiti | 1 | Sweden | 3 |
| Honduras | 1 | Switzerland | 7 |
| Hungary | 3 | Syria | 2 |
| Iceland | 1 | Turkey | 1 |
| India | 7 | Uruguay | 1 |
| Ireland | 4 | United States | 96 |
| Italy | 20 | Venezuela | 1 |
| Japan | 19 | Wales | 1 |

**Total medical colleges in all countries.....331**

**There are also about 20 sectarian schools in the United States, the graduates of which treat diseases, giving this country a total of ..... 116**

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*Contributors, subscribers and readers will find important information on the second advertising page following the reading matter*

SATURDAY, AUGUST 18, 1917

## MEDICAL EDUCATION—SEVENTEENTH ANNUAL REPORT

THE JOURNAL publishes this week, for the seventeenth consecutive year, statistics regarding medical education in the United States. During these seventeen years there has been a most encouraging improvement. At the present time it can be stated without exaggeration that medical education in this country is equal, if not superior, to that of other leading countries.

### FIRST PERIOD, 1900–1905

In 1900, THE JOURNAL began collecting statistics regarding medical colleges, students and graduates, and in 1901 the first Educational Number of THE JOURNAL was published. At that time there were 159 medical colleges, many of which were joint stock corporations, conducted largely for profit. Admission requirements were nominal; few medical schools had endowments or well-equipped laboratories, and only a few had salaried teachers. On the whole, conditions in medical education were far from satisfactory. For the first five years the statistics were thus collected and published by THE JOURNAL, and a beginning was made in the great campaign for the improvement of medical education. The publication of the statistics appeared to have little effect on either the number or the standards of medical colleges, but the knowledge obtained made it clear that if improvements were to be made, a permanent committee and adequate funds would be necessary to enable continuous work to be done. In 1904, therefore, the American Medical Association created a permanent committee — the Council on Medical Education — which in 1905 secured an executive secretary. Then the collection and publication of these statistics naturally became a part of the Council's work.

### PROGRESS FROM 1905 TO 1910

During the second five year period, 1905 to 1910, besides the collection and elaboration of these statistics, the Council on Medical Education began holding annual conferences on medical education, at which standards of preliminary and medical education were discussed. Also, in 1907 and 1909, respectively two complete tours of inspection of the various medical colleges were made in order to secure more complete and accurate data regarding them. From the data thus collected, the first two classifications of medical schools were prepared, the second of which was published in 1910. At the annual conferences and in the published reports of the Council, a special plea was made for the merger of medical colleges in various cities so that one strong medical school might replace the two or more weak institutions in each city. By 1910 such mergers of medical schools had taken place in several cities; thirty-five colleges and eight state licensing boards had adopted higher requirements of preliminary education; new laboratories had been established; more schools had obtained full-time teachers, and hospital facilities had been greatly increased. The number of colleges declined from 162 to 131; the number of medical students from 28,142 to 21,526, and the number of graduates from 5,600 to 4,440. The reductions, as was expected, were due to the merging of the better grade but financially weaker colleges and the extinction of a number of the lowest type institutions. Since in 1907 it had been found that this country had nearly half of the world's supply of medical schools, it was evident that an abnormal oversupply of inferior colleges was giving way to a smaller number of higher grade and better equipped institutions.

### PROGRESS FROM 1910 TO 1915

During the third five-year period — 1910 to 1915 — the Council established the students' register. In this, as in the previous activities, the Council received the cooperation of all the better medical colleges. During these five years also two other complete inspections of medical colleges were made and two new classifications published. This five-year period witnessed a further reduction of medical colleges from 131 to ninety-five, of medical students from 21,526 to 14,891, and of medical graduates from 4,440 to 3,536. This reduction in the number of medical colleges again was due to the merger of twenty medical schools with others, and to the closing of nineteen Class C institutions. Although the sum total of colleges was further decreased, there was a marked increase in the number of stronger and well-equipped institutions. The number of medical colleges which had adopted for admission one or two years of college work, in addition to a four-year high school education, was further increased from thirty-five (27 per cent.) to eighty-three (88 per cent.). Through a closer cooperation of the colleges with the Council in reports regarding new students enrolled, the methods employed by each institution in admitting students and the strictness in the enforcement of entrance standards were known with

fair accuracy. The continuous agitation for better conditions and publicity regarding the needs of medical education resulted in a marked increase in the endowments of medical schools, and large gifts for medical buildings, new laboratories, scholarships, endowed chairs and teaching hospitals had become of frequent occurrence. The fall of 1914 witnessed the general adoption by the majority of medical colleges of the standard of preliminary and medical education, which in 1905 the Council on Medical Education had referred to as "ideal."

### PROGRESS SINCE 1915

During the last two years, entrance requirements have been further extended to two years of college work, in addition to a high school education. While this exceeded the original ideal standard, it was a more practical requirement, since the arrangement of the curriculum in colleges and universities did not permit them to offer three heavy science courses, with laboratory work, in a single year. By June, 1916, the two-year standard had been adopted by forty-six medical schools and by seventeen state licensing boards. At the meeting of the House of Delegates of the American Medical Association in 1916, the Council was instructed not to retain in Class A after Jan. 1, 1918, any medical college which was not requiring two years of college work for admission. The House of Delegates also adopted a recommendation that the two-year standard represented the highest preliminary qualification that should be required in this country.

Under the increased entrance requirements, a material reduction in the number of medical students was to be expected. Statistics have shown, however, that after a year or so has been allowed for rearrangements under the higher standards, the enrolments in medical schools are again increased. It is noteworthy, therefore, that during the last three years the number of freshman students has increased in medical colleges which had adopted the higher standards three or more years previously. Although the total numbers of medical students and graduates still shows a decrease, that decrease for the last few years has been in the students and graduates of the Class C colleges — and these the country can very well dispense with. It should be a matter of congratulation that there are now between sixty and seventy medical schools in the United States graduating physicians trained as well as, if not better than, those from institutions in Europe, and that in the last fifteen years the numbers of medical students and graduates from these higher grade institutions[1] have been increased more than threefold.

1. Report of the Council on Medical Education, Table 1, The Journal A. M. A., June 9, 1917, p. 1758.

## HAY-FEVER AND POLLEN

The attention which has been paid in recent years to the problems of hay-fever has clearly established the exciting cause in the noxious pollen of a variety of plant forms. The species involved have in common the feature that they are all wind-pollinated, so that the large quantity of pollen that they produce is distributed by the air and can readily reach the nasal passages. Scheppegrell[1] has pointed out that the responsibility of the noxious plants for hay-fever depends, first, on the proximity of these plants, and, secondly, on the size of the pollen, which has an effect on their buoyancy. For example, the pollen of corn, though very toxic, is rarely responsible for hay-fever because the comparatively large size of the particles (80 microns) limits the potential area of its distribution to a few yards from the plant; whereas the pollen of the common ragweed (measuring only 15 microns) has a buoyancy so great that a wind velocity of twenty miles will carry it several miles. A spiculated surface tends to add to the buoyancy.

Knowledge of the distribution of the plants most commonly associated with hay-fever in different parts of the country, together with a better understanding of the mechanisms of pollen dissemination, ought to pave the way for remedial procedures. It has been remarked that when we observe the stringent laws enacted by various states for the exclusion of parasites injurious to their agricultural interests, suitable legislation for the protection of the large number of sufferers from hay-fever should present no difficulty. The first item of importance is to learn the facts on which appropriate progress must depend. It is now appreciated that the fall hay-fever of the Eastern states is due almost entirely to the pollen of *Ambrosia elatior*, the common ragweed. According to the recent report of Scheppegrell,[1] however, the situation in the Pacific and Rocky Mountain states is more complicated, owing to the fact that in those regions the fall hay-fever is caused by the pollen of a larger number of plants. These involve specimens of the *Artemisias*, *Ivas* and *Gaertnerias*, which include the popularly named mugwort and bur marsh elder.

The time has arrived when special efforts should be made to eliminate all such species as far as possible from the neighborhood of populated areas. Suitable grass-weed ordinances have already been proclaimed in certain regions. The grass pollens are responsible for much of the early (vernal) form of hay-fever; and their exclusion presents the least difficulty, perhaps, because they have a considerable size and are not carried to a great distance. When more details are known about other noxious forms, an educational campaign ought to be followed by success in amelioration of a most annoying factor that perennially recurs.

1. Scheppegrell, William: Hay Fever, Pub. Health Rep., July 20, 1917, p. 1135.

## CONTACT INFECTION

One of the great dangers to health from the assembling of large numbers of soldiers in barracks and camps is contact infection. Under this head are included such modes of conveyance as the inhalation of the minute microbe-laden droplets sprayed out from the mouth in the act of sneezing, coughing, laughing or speaking, the contamination of the fingers from handled objects of all sorts, and other multifarious methods by which living pathogenic microorganisms are transferred. Running all through the phenomena of contact infection is the significant fact that the transference of disease germs is fairly direct and immediate and that the share of inanimate objects—fomites—is relatively unimportant. It is the freshly smeared door-knob or push-button, the man who is in the same company or who sleeps in the adjoining bed that is most commonly the source of infection. Under natural conditions the majority of the bacteria pathogenic for man do not seem to multiply outside of the human body, but progressively die off when once they leave their sheltering host. It is the direct contact, the fresh secretions that are most dangerous.

Although these facts are known, practical control over contact infection is a matter of much difficulty. The methods of quarantine and isolation that have long been practiced are in themselves but roughly adapted for this purpose. The well-recognized clinical case of typhoid, diphtheria or epidemic meningitis constitutes only a small part of the danger against which it is necessary to guard. The missed cases and the carrier cases complicate the whole problem enormously. A person who suffers from a mild infection often does not call a physician but continues to associate with his fellows and may communicate disease to many others. He and they alike are ignorant of what is taking place. The discovery of such mild or atypical cases is one of the familiar objects of medical school inspection; it is equally important in military camps.

But this procedure again, even if successful, removes only part of the difficulty. In some diseases the dissemination of infection may occur before the manifestation of definite symptoms. The precocious carriers are a real menace in some infections. There is no need to dwell here on the importance of the convalescent carriers and healthy carriers in spreading disease. Specific pathogenic bacteria persist in a certain proportion of persons long after complete clinical recovery has taken place; pathogens are also found in some persons who apparently have never suffered from the specific disease and who show no symptoms of infection at the time of this finding or later. The healthy carrier can be detected only by a bacterial examination; and such an examination is by no means practicable in all cases.

The problem of preventing contact infection in military encampments is, therefore, one not readily solved. In epidemic meningitis, for instance, which experience has shown is likely to occur in winter camps, it is possible to isolate frank cases and to a certain extent those known to have been in close personal contact with such cases, but there are obvious practical limits to the isolation of contacts and to the degree of bacterial supervision that can be exercised over the troops. The changing personnel of the camp with the likelihood of the frequent introduction of fresh foci of infection is one difficulty. Again, a regiment may be required by military exigencies to depart for the front even before the medical authorities have been able to determine whether or not healthy meningococcus carriers are present in it. It is plain that under some conditions the work of medical and sanitary control must be directed toward lessening contact infection as far as practicable rather than preventing it altogether. It is probably true that increased liability to certain infections must be looked on as an unavoidable hazard of war.

All this does not mean that any legitimate measure for preventing contact infection can be relaxed or ignored. But the situation does suggest the employment as far as possible of measures other than isolation and segregation, not to the neglect of the latter, but as a partial substitute and reinforcement for them when they cannot be completely carried out. The avoidance of overcrowding in camp and barracks is a considerable safeguard against extensive contact infection, and wherever, as in the training of recruits, suitable preparation is possible, the provision of ample space for living quarters is a matter of the most elementary prudence. Early detection of illness, even of apparently slight ailments, is an important preventive measure in which noncommissioned officers may be trained to give much help. Probably something can be effected, too, by the instruction of officers and soldiers in personal hygiene. Personal cleanliness, hand-washing before eating, the proper care of "colds" for oneself and for one's associates, the avoidance or removal of "predisposing factors," such as constipation, unnecessary exposure to extremes of cold and heat, improper habits of eating, and the like, are all measures that will lessen the spread of infection by contact. Every one knows that under conditions of actual warfare all precautions of this sort must often go by the board. It must be remembered, however, that a large amount of trouble from contact infection has been caused among troops not only in the field, but also in the training camps. There would seem to be a chance not merely to protect the men against infection from direct contact with disease carriers, but also to educate them in those procedures of personal hygiene which will render them less likely to pick up infection and to transmit infection to others, and also

to impart some knowledge of the circumstances which weaken and predispose to infection. Instruction of this sort may fall on stony ground, but some will take root and bear fruit. Medical officers connected with the various cantonments and training camps may have opportunities for effective public health education and instruction in personal hygiene.

## TUBERCULOSIS OF THE LYMPH NODES

The relations of tuberculosis of the lymph glands to tuberculous processes in other organs have received much attention, but there still are differences of opinion, and careful observations are therefore of much interest. Harbitz[1] has just published the results of an extensive and painstaking study of tuberculosis of the lymph nodes. He says:

> In general one may say that in children most of the tuberculous infections have their point of departure in tuberculosis of the lymph nodes; the tubercle bacilli are deposited here after they have passed through mucous membranes or the skin; here they proliferate enormously or remain latent but virulent for a long time, years and years, eventually escaping and infecting other organs. Most frequently the dissemination occurs by the lymph vessels, but also by the blood vessels, and probably more often than now believed.

The observations are based on 2,906 necropsies in Christiania, Norway, during a period of twelve years, 2,489 of persons over 15 years, and 417 of children. Of the entire number, 431, or 14.8 per cent., died of tuberculosis, 351, or 14 per cent., being adults, and eighty, or 19 per cent., children. In 203 cases there was considerable involvement of the lymph nodes, and on analysis Harbitz finds that there were fifty-seven cases of primary tuberculosis of the bronchial lymph nodes, with eight somewhat doubtful; ten of primary extensive tuberculosis of the cervical glands, all in adults; nine of primary tuberculosis of the abdominal lymph nodes; forty of chronic tuberculosis of the lymph glands of the neck and chest; four of primary contemporaneous old tuberculosis of the cervical and the abdominal lymph glands; twenty-two of tuberculosis of the thoracic and abdominal nodes, and sixty-one of general lymph-node tuberculosis. The last group he considers the most interesting and the most important; it contained twenty-nine children, and in twenty of these the disease developed during the first three years of life, and with one exception tuberculosis caused death. There was marked involvement of the lymph nodes of the neck, chest and abdomen. The process is often a descending one in the neck, the swelling being most marked above and decreasing downward, whereas in the thorax it is ascending, less marked along the upper portion of the trachea and increasing toward the bifurcation and the hilum of the lung, where the enlargement is greatest. A more isolated process may be observed in the abdomen which from an anatomic point of view would not suggest continuous spread along lymph channels but rather repeated infection at various points from different sources. This is especially indicated when processes are present that evidently are of different age. In cases of extensive tuberculosis of all the groups of lymph nodes, a continuous spread from group to group or a hematogenous dissemination may be assumed. Ungermann is cited as believing that in such cases the infection is by the blood stream, usually by way of the thoracic nodes, which in turn are infected from the lung following inhalation of tubercle bacilli.

According to Harbitz, in about half the cases of lymph-node tuberculosis in children, death results from pulmonary tuberculosis, in about one fourth from tuberculosis of the intestinal tract with the primary lesion in the abdominal lymph nodes presumably, and in the remaining fourth from miliary tuberculosis or tuberculous meningitis.

The general lymph-node tuberculosis was found in thirty-two adults, and in thirty it was fatal. It would seem that the infection may originate at different times and in different ways at the various points, especially when the process is discontinuous and of different ages in the various locations. Cases of generally disseminated, apparently continuous tuberculosis of all the important groups of lymph nodes are the more numerous, and the process is usually of long standing.

The condition of the nodes in the neck and the chest is much the same as in the children of this group; but in the abdomen the process is somewhat more extensive. There may be enlargement of the mesenteric nodes, sometimes accompanied by intestinal ulcers; involvement of the retroperitoneal nodes, especially those behind the stomach and pancreas; and farther down there may be swelling of the nodes along the iliac vessels to the inguinal region, decreasing in size downward. The infection plainly seems to have come about by a continuous extension along the lymph vessels from one of the groups of lymph nodes, a procedure easily within the limits of possibility, taking into account the generally accepted reversal of the lymph stream under pathologic conditions and the limited means of communication between the lymphatic systems of the various organs. In an earlier article, Harbitz[2] maintained that this mode of extension was both frequent and important. Tendello and Staub both support this view, the latter having apparently demonstrated the spread of tuberculosis along lymph vessels, particularly from the abdominal lymph nodes to the liver and spleen. A plausible explanation seems to be that one or more groups of nodes become infected, and the process spreads from node to node

1. Harbitz, Francis: Jour. Infect. Dis., 1917, **21**, 196.

2. Harbitz, Francis: Jour. Infect. Dis., 1905, **2**, 142.

in the infected group or groups and to the internal organs adjacent, and thence to other lymph nodes and vessels. In adults as well as in children it seems probable that in many cases distribution takes place by way of the blood.

That the process is not arrested may be due to the virulence of the organisms or to repeated infections together with a lowered resistance. Death from tuberculosis is the usual termination of lymph-node tuberculosis, and in the opinion of Harbitz most of the cases of pulmonary tuberculosis in patients with lymph-node involvement are derived from infection of the lymph nodes either by direct perforation of a node into the lung or by hematogenous invasion.

Whether much of the tuberculosis in adults is a result of tuberculous infection in childhood or of infection in later life is an open question. Andvord, Römer, Much and Hamburger support the former view. According to Andvord's experience only about 20 to 30 per cent. of fatal adult tuberculosis was due to primary infection, whereas in from 70 to 80 per cent. the infection probably began in childhood. Tillisch, while satisfied from clinical experience of the dependence of a certain amount of tuberculosis in adults on infection during childhood, was disappointed by his inability to prove this on the basis of pathologic anatomy. Harbitz points out, however, that from his first series of cases in 1901-1902, he estimated that from 15 to 20 per cent. of all cases of pulmonary tuberculosis in adults arise from tuberculosis in other organs, particularly the lymph nodes, by way of the blood. In the later report on lymph-node tuberculosis the death rate from tuberculosis was 14.8 per cent., and in 18 per cent. of those dying the anatomic picture clearly indicated tuberculous infection in childhood; this, we see, corresponds well with his earlier observations. That tubercle bacilli may live and retain their virulence over long periods of time has been abundantly proved, and lends support to the theory of autoinfection.

This study will tend to renew interest in tuberculosis of the lymph nodes and the many unsolved problems connected therewith. The results emphasize again such fundamental questions as the nature of the affinity of the tubercle bacillus for lymphatic tissue, reinfection from the outside and autoinfection of the tuberculous, the different degrees of virulence of the bacillus and of resistance on part of the host as expressed in the variable course of tuberculosis, and others. But the results also have direct practical significance as they emphasize the great importance, immediate and remote, even under the most conservative view, of lymph-node tuberculosis in children, which to some extent at least may be prevented by securing for children clean food, clean surroundings, and freedom from direct contact with the tuberculous.

# *Current Comment*

## REPORT ON PREMEDICAL EDUCATION

The highest desirable standard of education preliminary to medicine is two years of college work based on a four-year high school education. This standard has now been generally adopted by the medical colleges of the United States. Aside from the general understanding that this college work should include courses in physics, chemistry, biology and possibly a course in a modern language, no attempt has heretofore been made to outline the subject content of this two-year premedical college course. Last February a special committee was selected to study the problem and to suggest the subjects which could be included in this two-year course whereby it would best prepare the student for his subsequent medical studies. Besides representatives of the Council on Medical Education and the Association of American Medical Colleges, a representative was chosen by the Association of American Universities, and another member of the committee is closely identified with the work of the North Central Association of Colleges and Secondary Schools. Although of great importance to medical education, this is a matter depending on the colleges of arts and sciences, and for that reason the associations of such colleges are represented on the committee, and presidents and deans of such colleges have been freely consulted in the study of the problem. The preliminary report of this special committee, printed in this issue,[1] will be of special interest to those interested in medical education.

## OPPORTUNITIES FOR WOMEN IN LABORATORY WORK

The disarrangement of scientific and professional life that has come with the war is filling some needs as well as creating them. College and university women in increasing numbers are finding opportunities for the utilization of their training in many lines other than the pedagogic. This is true especially of work in scientific laboratories, particularly bacteriologic and public health laboratories. The draft of young men into the Army and the immediate demand for experienced laboratory men in field service and Red Cross sanitation will create numerous vacancies in municipal, hospital and waterworks laboratories which can often be well filled by trained women. In many respects women are peculiarly well suited for such positions as require a mastery of bacteriologic technic. The accuracy and attention to detail involved in certain manipulations are often manifested by women in a high degree. It seems desirable under present conditions to encourage women to enter on the training necessary to fit them for laboratory assistants and helpers. There should be no slurring over of the essential preliminaries, such as the fundamental courses in chemistry; and, in giving advice to prospective students, more than ever must due regard be

1. See page 546.

paid to personal aptitude. The vital relation of public health and diagnostic work to the welfare of the nation is reason for insisting on a high competence and exceptional personal qualifications in all entering this field. Given these, numerous opportunities for laboratory service will soon be open for the skilled woman worker. Heads of university laboratories may consider whether they should not offer special encouragement to women contemplating this work. The bacterial control of important water filtration plants, and the work at hospitals and at public health laboratories must not get into incompetent hands. An abundant supply of well-trained laboratory women will avoid some of the difficulties before us. The competent woman laboratory worker may be assured of satisfactory opportunities.

## PATRIOTISM RAMPANT

At a recent meeting, the Michigan State Board of Registration in Medicine adopted the requirement of a two-year college course as the minimum standard of preliminary education for all students matriculated in the session of 1918-1919. It is stated that this course should include chemistry, physics, biology, English and a foreign language. The board voted, however, that no credit be allowed for any courses in German. While there can be only the highest praise for the action of the board in raising its requirements for preliminary education, its peculiar action regarding the German language, based, without doubt, wholly on the present war, is not to be commended. The achievements of German scientists, of French and British scientists, of scientists of all nations, are imperishable. That Robert Koch, Ehrlich and other German scientists happened to be born under the dominance of a militaristic monarchy is not to the discredit of their scientific achievements.

## AN IMPROVED MEDICAL PROFESSION

Following the Civil War, the number of medical schools in the United States was increased by leaps and bounds. These schools were largely of the proprietary type. The course at that time extended over only two years following a year with a preceptor, but that was practically all the time required to obtain a training in the medical knowledge of the time. During the same period, however, the factors were developing which would eventually demand an entirely different type of medical teaching institution. The discovery of bacteria resulted in definite knowledge regarding the origin, course and treatment of many of the common diseases, and greatly extended the field of medical knowledge. Prior to 1900, few of the medical schools in the United States had succeeded in keeping pace with this rapid increase in medical knowledge. Many institutions realized the need of improvement, but were hindered from progress not only by the lack of money but also by severe competition. Without waiting for an increased financial income from state aid or private endowments, stronger institutions were established through the merger of two or more weaker institutions in each of several cities.[1] The teaching of modern medicine, however, required something more than improved medical schools. It required better preliminary education than was furnished by the ordinary high school course. Hence the increase in admission requirements for a high school education to one year, and later two years, of college work was essential in order that the students might master the modern medical course. The highest desired standard of preliminary education has been reached, and an oversupply of comparatively low grade institutions has given way to a smaller but adequate supply of high grade, thoroughly equipped medical schools. Although the total number of medical students is considerably less than that of fifteen years ago, the number admitted with one or two years of college education has increased several-fold, and the proportion of well trained physicians each year has likewise been increased. Moreover, the rank and file of the profession has been greatly improved by a campaign against the quack and the nostrum vender. The field of medicine has, therefore, been largely cleansed of low type educational institutions and of pretenders, who have found a temporary ambush in the ranks of the drugless cults — and the responsibility for them does not rest with the medical profession.

## MEDICAL STUDENTS AND CONSCRIPTION

As stated last week, there were, all told, 13,764 medical students enrolled in our medical colleges for the session 1916-17. Of these, 3,379 were recently graduated, leaving 10,385 to be regarded as medical students. Of these, 4,107 were freshmen, 3,117 sophomores, 2,866 juniors, and 295 seniors who were not graduated. Of the 10,385 we have had replies from 6,474, up to the time of going to press. Of these, 5,552 are subject to draft, 777 are exempt on account of age — 637 being under, and 140 over, the draft age; 40 are aliens, and 105 have already enlisted in some form of military service.

| Class | Total Replies | Total to be Drafted | | First Call | | Second Call | | Later Call | | Age Exempt | | Aliens | Enlisted |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. | % | No. | % | No. | % | No. | % | Under | Over | | |
| Freshmen... | 2,176 | 1,708 | 79.4 | 448 | 26.2 | 307 | 17.9 | 953 | 55.8 | 375 | 33 | 17 | 43 |
| Sophomores | 2,071 | 1,817 | 87.7 | 482 | 26.5 | 366 | 20.1 | 969 | 53.3 | 170 | 46 | 13 | 25 |
| Juniors..... | 1,601 | 1,486 | 92.8 | 461 | 31.0 | 300 | 20.2 | 725 | 48.8 | 41 | 43 | 8 | 23 |
| Seniors..... | 218 | 206 | 94.5 | 82 | 39.8 | 44 | 21.3 | 80 | 38.8 | 5 | 5 | 2 | .. |
| Not stated.. | 408 | 335 | 83.0 | 134 | 40.0 | 55 | 16.4 | 146 | 43.6 | 46 | 13 | .. | 14 |
| Totals..... | 6,774 | 5,552 | | 1,607 | | 1,072 | | 2,873 | | 637 | 140 | 40 | 105 |
| Percentages | ..... | 85.7 | | 28.9 | | 19.3 | | 51.8 | | 9.8 | 2.2 | 0.6 | 1.6 |

Of the 5,552 subject to draft, it is estimated that 1,607 (28.9 per cent.) are included in the first call; 1,072 (19.3 per cent.) in the second call, and 2,87 (51.8 per cent.) in the third or later calls. Present indications are that the estimate for the first call was entirely too low, and that instead of being 28.9 per cent. it will likely be nearer 40 per cent. In any event, 35 per cent., from present indications, will be none too high as a basis for estimation. The returns

1. All together, fifty-three institutions were thus merged with others. But still the number of schools was more than adequate to meet the needs of this country.

already received indicate that of the 10,385 medical students, 8,900 would be subject to the draft, the remaining 1,485 have previously enlisted or are exempt on account of age or alien birth. As will be noted, age limitations come mostly among students in the lower classes, and the higher classes, therefore, are more seriously depleted.

### MEDICAL STUDENTS AND THE SHORTAGE OF INTERNS

In January, 1915, less than six months after the war had started, the question as to the future supply of physicians in Great Britain had become so serious that, as stated in our London Letter dated Jan. 15, 1915, an army order was issued giving permission to any medical student who had gone to the front to return home to complete his studies. One of the reasons for this action was that at that time, owing to the impossibility of obtaining interns for the hospitals, senior students were being employed in their places. This condition developed in the hospitals of Great Britain and France at the outset of the war, and the hospitals of those countries have been handicapped in this regard ever since. Already in this country the same condition is developing. All of the interns in some hospitals have either already made application for positions in the Medical Reserve Corps or have been drafted. Many of these hospitals were preparing themselves to fall back on the senior students, but now that these students will be no longer available, these hospitals will be most seriously handicapped. In our Correspondence columns is a letter from Dr. S. S. Goldwater, chairman of the Committee on Hospitals of the Mayor's Committee on National Defense, of New York, in which he states that Judge Hughes — former Justice of the U. S. Supreme Court — believes that there is no relief for the drafting of medical students except by act of Congress. How thoroughly Judge Hughes investigated the question before he gave this decision we do not know. In any event, if no remedy rests with the Secretary of War or with the President, the question is so vitally important that an appeal should be made to Congress. And this appeal should not be made on behalf of the medical profession; not on behalf of medical students, but in the direct interest of the public and of the welfare of our Army.

**Plethora.**—When blood abounds it brings health, and from it sanies is produced, such as we see in incised wounds. Blood becomes superabundant by reason of too much food and drink, and is corrupted by its ill concoction; and where it passes beyond its natural limits, it induces some bodily ailment; and in whatever part it settles it becomes corrupted and exhausts and injures the body. Thus, corrupt blood causes the mouth to burn, vitiates the breath and makes it stink. For when the blood is healthy it contains the breath [or spirit], and maintains the body so that it may support either heat or cold. But when it is superabundant it produces sanies or bile, as it is called, which exhausts the spirit, and this gives rise to the bad odor. A substance is also produced called acid or bitter bile, which is regarded as the substance of disease, for it excites the production of heat. Phlegm produces chafing and pain in the intestine. It causes distention, which inflates the body so that it seems as though it would burst.—Ancient Pathology.

## *Medical Mobilization and the War*

### Increase Personnel at Training Camps for Medical Reserve Officers

During the past week additional medical reserve officers have been ordered to the various training camps so that there are now 1,000 physicians or more at each of the training camps. In addition, some 130 colored physicians are in training with colored troops at Fort Des Moines, Iowa. Of those physicians who were in the first training camp beginning June 1, some 30 per cent. have been recommended for promotion to higher rank than that held at the time they reported for active duty. The recommendation was based on proficiency and adaptability to the service. Many physicians who reported to the camps, June 1, have now been ordered elsewhere for active duty.

### Reporting for Duty Before Receipt of Commission

A number of men who made application for appointment to the Medical Reserve Corps have written that while they have not received their commission they have received telegrams asking them to accept, and later ordering them to active duty in spite of the fact that the commission had not yet been received. The explanation is, as we have mentioned previously, that there has been considerable delay in issuing commissions to men who have been recommended, the delay occurring chiefly in the Adjutant-General's Office. So as not to prevent ordering medical officers to early training, the Surgeon-General's Office has adopted the plan of telegraphing those recommended that they have been recommended and asking them whether or not they will accept. If the reply is satisfactory, the officer may then be ordered to active duty, the commission reaching him in due time. Those who report at the training camps who have not already taken the oath of allegiance are sworn in at the camps.

### Minimum Equipment for Medical Reserve Officers Ordered to Active Duty

Inquiries are continually coming as to the minimum equipment which a medical reserve officer should have when reporting for active duty at a training camp. The articles listed below may be considered a minimum requirement. They may be purchased from the Quartermaster's Department; the prices are approximate.

| | | |
|---|---|---|
| 1. Hat, service, and cord | $1.04 | |
| 2. Shirts, o. d., 2, each | 2.38 | |
| 3. Breeches, khaki, o. d., 2, each | 2.31 | |
| 4. Shoes, 2 pair, each | 2.81 | |
| 5. Blankets, 2 pair, each | 3.08 | |
| 6. Cot, gold medal | 2.06 | |
| 7. Mattress | | |
| 8. Socks, light wool, 6 pairs, each | .13 | |
| 9. Leggings, 1 pair | 1.81 | and up |
| 10. Insignia for collar | | |
| 11. Folding chair | | |
| 12. Towel | | |
| 13. Toilet articles | | |
| 14. Pillow | | |

Other articles, most of which are not costly, may be purchased piece by piece as needed.

### Army Rank for Red Cross Workers

The President has accepted the cooperation and the assistance of the American National Red Cross with the land and naval forces of the United States. To facilitate the discharge of their duties, members of the Red Cross, other than units, sections and individuals accepted for service by the War Department and incorporated in the enlisted strength of the Medical Department of the Army, will be recognized by titles with assimilated rank. This rank extends from Major-General down to Private. To the chairman of the central committee and to the chairman of the War Council are given the rank of Major-General; members of the War Council and vice chairman of the central committee, Brigadier-General; director general, Colonel; the assistant director general and commissioner, Lieutenant-Colonel; directors, Major, and assistant director, Captain and First Lieutenant. A secretary will receive the rank of Sergeant-Major, and base hospital employees will receive the rank of Sergeant, Corporal and Private, according to the various duties which

they will perform. *These commissions confer no military authority or obligation, nor right to the pay or allowances of similarly described grades in the United States Army.* They are merely certificates of identity indicating that the officials of assimilated rank are persons in whom the Commander-in-Chief of the Army and Navy and the American Red Cross have confidence. Insignia and special uniforms to be supplied by the American National Red Cross will indicate the rank of those mentioned. *The use of the military titles, rank and uniform is authorized only for American National Red Cross representatives actually in foreign countries constituting the theater of active war.*

### Women Physicians Organized

A committee of women physicians has been added to the General Medical Board of the Advisory Commission of the Council of National Defense. Dr. Rosalie Slaughter Morton of New York has been appointed chairman. Plans are being formulated under which the new committee will operate. The other members of the committee are: Drs. Caroline M. Purnell, Caroline Towles, Florence N. Ward, Mary Lapham, Emma B. Culbertson, Cornelia C. Brant and Marion Craig Potter.

### New Hospital Ship

On the urgent recommendation of Surgeon-General Braisted, Washington, D. C., the steamship *Havana* of the Ward Line has been acquired for service as a naval hospital ship. The work of remodeling has already been commenced, and the hospital ship will be able to accommodate about 300 patients. It is probable that another hospital ship will be obtained later.

### Higher Grade for Naval Reserve Officers

A correspondent of the *Army and Naval Journal,* in its August issue, calls attention to the apparent injustice of the rank of officers in the medical reserve in the Navy, as compared with that of the Army. In the latter organization, commissions are first issued as lieutenants, but promotions to captain or major may be obtained; in the Navy, the only appointment is that of surgeon or lieutenant, junior grade.

### Physicians Recommended for Commission in the Reserve Corps

During the week ending Aug. 11, 1917, 914 physicians were recommended for commission in the Medical Reserve Corps, the proportion being ten majors, 102 captains and 802 lieutenants.

### For Conspicuous Gallantry and Devotion to Duty

It is apparently the opinion of the public that the work of the medical officer in war is somewhat of a sinecure. All he has to do, according to the common belief, is to stay in some safe place back of the firing line and acquire surgical experience. It is not necessary to say that his work is not altogether a sinecure and that there is some danger connected with it. As a matter of fact, the medical officer has opportunity to display courage and heroism fully equal to that of the officer of the line. Each week the British journals carry announcements of honors awarded to medical officers. A few of these are cited as evidence of bravery and of the type of work in which medical officers are engaged.

#### DISTINGUISHED SERVICE ORDER

TEMP. CAPT. JAMES HARDING BARRY, M.C., R.A.M.C., attached to London Regiment, for conspicuous gallantry and devotion to duty in attending to the wounded under exceptionally trying conditions. Under very heavy shell fire he dug out five men who were buried and amputated two men's legs on the spot. He showed utter disregard of any personal risk and his example was splendid.

MAJOR LIONEL WILFRED BOND, Australian A.M.C., for conspicuous bravery and devotion to duty. When in charge of advanced collecting and forwarding posts his total disregard of danger under a terrific hail of gas shells, H. E., and shrapnel fire gained him the confidence of all ranks, and greatly assisted the evacuation of the wounded. Later, although wounded and partly gassed, he refused to leave his post, and his bravery and devotion saved a very critical situation.

TEMP. CAPT. JAMES HENRY FLETCHER, M.C., R.A.M.C., for conspicuous gallantry and devotion to duty. He showed the utmost bravery and coolness when commanding the bearers. He worked continuously under artillery and machine-gun fire. It was largely due to his gallant conduct that so many wounded were safely evacuated.

#### BAR TO THE MILITARY CROSS

TEMP. CAPT. CHARLES BROMLEY DAVIES, M.C., R.A.M.C., for conspicuous gallantry and devotion to duty. He was in command of the bearer division when evacuation was most difficult. He showed great gallantry and resource in pushing forward under heavy fire and rescuing several wounded men.

TEMP. CAPT. HAROLD GARNETT JANION, M.C., R.A.M.C., attached R. H. A., for conspicuous gallantry and devotion to duty. He was assisting to remove the pilot from a wrecked aeroplane when the spot came under heavy fire from a hostile battery. Several of the bearers were wounded, but by his courage and example this officer collected fresh bearers and conveyed the wounded men to safety. This task was carried out under continuous shell fire.

#### MILITARY CROSS

TEMP. CAPT. HENRY JOSEPH COTTER, R.A.M.C., attached Lincolnshire Regiment, for conspicuous bravery and devotion to duty. Although wounded on the previous day, he declined to be relieved, and continued to dress wounded in the open under heavy fire, going through heavy barrage to reach some men lying out in an exposed condition.

TEMP. CAPT. ALBERT VICTOR CRAIG, R.A.M.C., attached R. F. A., for conspicuous gallantry and devotion to duty. Though suffering himself from the effect of gas shells, he displayed the greatest bravery and the most untiring energy in attending to the wounded under fire of heavy guns and gas shells. He risked his life day and night without the slightest hesitation.

TEMP. LIEUT. CYRIL DUNCAN, R.A.M.C., for conspicuous bravery and devotion in attending wounded close to a large ammunition dump which was on fire, with splinters and shrapnel shells flying about, and later, though partially gassed, attended wounded under heavy gas shell fire.

TEMP. CAPT. CHARLES REGINALD RALSTON HUXTABLE, R.A.M.C., attached Lancashire Fusiliers, for conspicuous gallantry and devotion to duty. He showed the utmost skill and bravery in attending to and evacuating wounded. When seven of his bearers were buried by a shell he at once, despite the intense hostile bombardment, organized a party and dug them out.

CAPT. CYRIL CHARLES MINTY, Australian A.M.C., for conspicuous gallantry and devotion to duty. He showed the greatest courage and fearlessness in attending wounded whilst exposed to heavy shell fire and gas fumes, and assisting to carry them to the collecting post. The stretcher-bearers had suffered severe casualties, and it was owing to his magnificent example that they maintained their courage and endurance.

TEMP. CAPT. JOHN FINLAYSON MCGILL SLOAN, R.A.M.C., for conspicuous gallantry and devotion to duty. His dressing station being blown in on the top, he dressed over 200 cases under very difficult conditions. He had to change his dressing station twice.

TEMP. CAPT. DONALD ALEXANDER WARREN, R.A.M.C., attached Royal Warwickshire Regiment (Lieutenant C.A.M.C.), for conspicuous gallantry and devotion to duty. He continued to attend wounded for over an hour under heavy artillery and machine-gun fire and in full view of the enemy. Later he established an aid post, and carried it on for forty-eight hours without rest under continuous fire.

### Orders to Officers of the Medical Corps

Major Charles Y. Brownlee, M. C., to Governors Island, N. Y., for duty as assistant to department surgeon.

First Lieut. Robert E. Parrish, M. C., to station and duty at Fort Slocum, N. Y.

Sick leave two months to Major John A. Murtagh, M. C., Fort Sam Houston.

Major Albert G. Love, M. C., to Washington, for duty.

Major Ernest G. Bingham, M. C., to Fort Des Moines for duty as C. O. of base hospital to be established there.

Officers of M. C. will proceed to place specified after their names for duty as C. O. of base hospital to be established: Capt. Jay D. Whitham, Camp Upton, Yaphank, L. I., N. Y.; Capt. William L. Sheep, Camp Travis, Fort Sam Houston; Capt. Omar H. Quade, Camp Meade, Annapolis Junction, Md.; Major Ferdinand Schmitter, Camp Lee, Petersburg, Va.; Capt. Joseph A. Worthington, Camp Taylor, Louisville, Ky.; Capt. Shelley U. Marietta, Camp Gordon, Atlanta, Ga.

Capt. George B. Foster, Jr., M. C., to station and duty at Atlanta, Ga.

Capt. William B. Meister, M. C., on relief treatment at Letterman Hospital, to Presidio of San Francisco, for duty.

First Lieuts. Charles L. Gandy and William W. Vaughan, M. C., on arrival in United States, to Allentown, Pa., for duty.

### Orders to Officers of Medical Reserve Corps

#### ALABAMA

To FORT OGLETHORPE, for duty, Lieut. James K. Miller, Epes.

To FORT SAM HOUSTON, for duty, Lieuts. Raymond B. Ramage, Lafayette, and Llewellyn H. Ledbetter, Goodwater.

#### ARIZONA

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, SOUTHERN DEPT., for assignment to duty, Capt. Charles H. Bowker, Warren.

#### ARKANSAS

To FORT BENJAMIN HARRISON, for instruction, Lieut. Horace F. Villars, Little Rock.

To FORT OGLETHORPE, for duty, Lieut. Victor K. Allen, Hope.

#### CALIFORNIA

To ALLENTOWN, PA., with Ambulance Co. No. 2 for duty, Capt. Albin Powell, Berkeley.

To AMERICAN UNIVERSITY, Washington, witn 10th Engineers for duty, Lieut. Alfred L. Phillips, San Francisco.

To LETTERMAN GENERAL HOSPITAL, Presidio of S. F. for duty, Capt. Morton R. Gibbons, San Francisco.

To PRESIDIO OF SAN FRANCISCO, for duty with Provisional Field Hospital Co. A., Major George F. Shiels, San Francisco; with Field Hospital Co. No. 2, Capt. Gulbert M. Barrett, Lieut. William L. Moore, San Francisco; for duty, Lieut. Harold W. Wright, San Francisco.

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Majors Harry R. Oliver and Alanson Weeks, San Francisco; Capts. Samuel M. Alter, Los Angeles; William L. Dunn, Oakland; B. O. Adams, Riverside; Robin C. Howe and Jule B. Frankenheimer, San Francisco; Lieuts. Charles B. Alexander, Alhambra; Walter L. Ellis, Calexico; Thomas S. Long, Cambria; Louis J. E. Gouguet, Chico; Wallace A. Reed, Covina; Otto P. Floreth, Dixon; Pernice A. Mix, Exeter; Henry Ehlers, Fowler; Allan N. Kerr, Hawthorne; Roderick H. Shippey, Long Beach; Charles B. Adams, John I. Boyer, Miles A. Heffelfinger, Clarke L. McClish, Los Angeles; Franklin M. Seibert, Mayfield; Henry M. Fine, Oakland; Charles H. Freeman, O. Anderson, Ocean Park; Alva D. S. McCoy, Pasadena; Arthur L. Brown, Riverside; Howard McD. Cameron, Arthur L. Munger, Sacramento; Nathan P. Barbour, Hugh K. Berkley, Walter W. Fenton, Ernest D. Hatch, Obe H. Hoag, San Francisco; Wood C. Baker, San Mateo; Rafael G. Dufficy, San Rafael; and L. J. Schermerhorn, Stockton.

To SAN FRANCISCO for duty, Major Henry S. Kiersted, Burlingame; Lieut. Francis B. Dwire, Gardena.

Resignation of Capt. Edward Von Adelung, Oakland, is accepted.

### COLORADO

To DENVER, enlisting personnel of Red Cross Ambulance Co., No. 30, Capt. Thomas M. Hopkins, Denver.

To FORT DAVIS, ALASKA, Lieut. H. C. Burson, Pueblo.

To SAN FRANCISCO, for duty, Lieut. Frank N. Stiles, Grand Junction.

### CONNECTICUT

To FORT BENJAMIN HARRISON, for instruction, Lieut. John J. Carden, Bridgeport.

### DISTRICT OF COLUMBIA

To AMERICAN UNIVERSITY, Washington, with 10th Engineers for duty, Major James G. McKay, Washington.

To FORT BENJAMIN HARRISON, for instruction, Lieuts. John M. Stanley, and Ernest K. Stratton, Washington.

### FLORIDA

To ALLENTOWN, PA., for duty, Capt. Owen H. Kenan, Palm Beach.

To FORT BENJAMIN HARRISON, for instruction, Lieut. Bascom H. Palmer, Tampa.

Honorably discharged, Lieut. Robert E. Godard, Quincy.

### ILLINOIS

To FORT BENJAMIN HARRISON, for instruction, Lieuts. Frederick A. Blesse, John E. Robinson, Chicago; and Edward S. Murphy, Dixon.

To CHICAGO, as instructor in military roentgenology, Capt. Edward S. Blaine, Chicago.

To FORT CONSTITUTION, N. H., for duty, Lieut. W. P. MacCracken, Chicago.

To FORT DES MOINES, IOWA, for duty, Lieut. Julian Dawson, Galesburg.

To FORT RILEY, for duty, Lieut. S. R. Johnson, Divernon.

To FORT SHERIDAN, ILL., for duty, Lieut. Harry S. Gradle, Chicago; with Ambulance Co. No. 9, Capt. Stephen V. Balderston, Evanston, and Lieut. James E. McNeel, Chicago.

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPT., for assignment to duty, Lieut. Arthur Betts, Chicago.

So much of Par. 72, S. O. 165, War Dept., July 18, 1917, as relates to Lieut. Robert H. Lowry, Jr., Chicago, is revoked.

### INDIANA

To FORT BENJAMIN HARRISON, for instruction, Lieuts. Arlie J. Ullrich, Aurora; and Chester A. Stayton, Indianapolis.

To FORT OGLETHORPE, for duty, Lieut. Charles P. Major, Indianapolis.

To FORT SNELLING, MINN., for duty, Lieut. Kenneth L. Craft, Indianapolis.

To INDIANAPOLIS, for duty, Lieuts. Ernest D. Wales, Indianapolis; enlisting personnel of Red Cross Ambulance Co. No. 18, M. B. Light, Indianapolis.

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Lieut. Frederick Falk, Indianapolis.

So much of Par. 161, S. O. 171, War D., July 25, 1917, as relates to Lieut. M. H. Krebs, Huntington, is revoked.

Resignation of Lieut. Fred E. Hickson, Indianapolis, is accepted.

### IOWA

To NEW YORK CITY, for duty, Capt. James F. Taylor, Sioux City.

To FORT BENJAMIN HARRISON, IND., Lieut. Ward S. Wells.

### KANSAS

To FORT LEAVENWORTH, for duty, Lieut. John DeW. Riddell, Salina.

To TOPEKA, KAN., enlisting personnel of Red Cross Ambulance Co. No. 44, Lieut. Charles H. Lerrigo, Topeka.

### KENTUCKY

To FORT BENJAMIN HARRISON, for instruction, Lieut. James W. Bruce, Louisville.

To FORT DES MOINES, IOWA, for duty, Lieut. V. J. Davis, Paducah.

### LOUISIANA

To FORT DES MOINES, IOWA, for duty, Lieut. W. Wallace, Shreveport.

To FORT SAM HOUSTON, TEXAS, for duty, Lieut. T. B. Bird, New Orleans.

### MAINE

To FORT DES MOINES, IOWA, for duty, Lieut. H. White, Portland.

### MARYLAND

To FORT BENJAMIN HARRISON, Lieuts. Hertel P. Makel and Edwin E. Mayer, Baltimore.

### MASSACHUSETTS

To FORT ADAMS, R. I., for duty, Lieut. B. M. Latham, Mansfield.

To ALLENTOWN, PA., for duty, Lieut. Otho L. Schofield, Newton Lower Falls.

To BOSTON, as instructor of military roentgenology, Major Arial W. George, Brookline.

To PITTSFIELD, MASS., enlisting personnel of Red Cross Ambulance Co. No. 13, Lieut. Harry J. Tate, Pittsfield,

So much of Par. 47, S. O. 172, July 26, War D., as relates to Major Fred B. Lund, Boston, is revoked.

Honorably discharged, Lieut. Austen F. Riggs, Stockbridge.

### MEXICO

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, SOUTHERN DEPARTMENT, for assignment to duty, Lieut. Charles C. Cooke, Vera Cruz

### MICHIGAN

To DETROIT, enlisting personnel of Red Cross Ambulance Co., No. 28, Capt. Griffith A. Thomas, Detroit.

To FLINT, MICH., enlisting personnel of Red Cross Ambulance Co. No. 21, Capts. Walter H. Winchester, No. 42, F. A. Roberts, Flint.

To FORT BENJAMIN HARRISON, for course of instruction, Lieut. Glenn L. Coan, Detroit.

To FORT LEAVENWORTH, for duty, Lieut. Eugene Hall, Reading.

To MEMPHIS, TENN., enlisting personnel of Red Cross Ambulance Co. No. 45, Capt. Walter R. T. Sharpe, Romeo.

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, SOUTHERN DEPARTMENT, for assignment to duty, Lieut. Cullen H. Hendry, Detroit.

To duty with Sixth Engineers, N. A., Lieut. Glenn B. Carpenter, Detroit.

### MINNESOTA

To FORT BENJAMIN HARRISON, for instruction, Lieut. Cleon J. Gentzkow, Minneiska.

To LITTLE ROCK, for duty, Lieut. Frank H. Clay, St. Charles.

To MINNEAPOLIS, enlisting personnel of Red Cross Ambulance Co. No. 37, Lieut. Ralph T. Knight, Minneapolis.

Honorably discharged, Lieut. Hugh F. McGaughey, Winona.

### MISSISSIPPI

To FORT DES MOINES, IOWA, for duty, Lieut. B. T. Williamson, Greenwood.

To FORT SAM HOUSTON, for duty, Capt. Erskine P. Odeneal, Gulfport; Little B. Neal, Jackson, and Albert C. Lofton, Williams.

To VICKSBURG, enlisting personnel of Red Cross Ambulance Co. No. 38, Capt. N. Stewart, Jackson.

Honorably discharged, Capt. Harry Greenberg, Fayette.

### MISSOURI

To FORT DES MOINES, IOWA, for duty, Lieut. S. H. Warfield, Louisiana.

To FORT RILEY, KAN., Lieut. E. T. Anderson, Kirbyville.

To KANSAS CITY, MO., enlisting personnel of Red Cross Ambulance Co. No. 24, Capt. Ernest W. Cavaness, Kansas City.

To SAN FRANCISCO, in time to sail for Hawaii for duty, Capt. Richard S. Bryan, St. Louis.

So much of Par. 10, S. O. 166, War D., July 19, 1917, as relates to Capt. Richard S. Bryan, St. Louis, is revoked.

### MONTANA

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Lieut. Karl H. Kellogg, Stevensville.

### NEBRASKA

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Lieut. Bryant R. Simpson, Adams.

### NEW JERSEY

To BUTLER, N. J., enlisting personnel of Red Cross Ambulance Co. No. 33, Capt. William H. Lawrence, Jr., Summit.

To FORT DES MOINES, IOWA, for duty, Lieut. Clarence S. Janifer, Newark.

To MONMOUTH PARK, N. J., for duty, Lieut. B. A. Furman, Newark.

To NEW YORK, Transport Service for duty, Lieut. Peter G. Fagone, Hackensack.

### NEW MEXICO

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, SOUTHERN DEPARTMENT, for assignment to duty, Lieut. Dwight Allison, Gallup.

### NEW YORK

To ALLENTOWN, PA., for duty, Lieut. Conde de Sales Pallen, New York.

To FORT BENJAMIN HARRISON, for instruction, Capt. Daniel W. Wynkoop, Babylon; Lieuts. Roland A. Davison, Brooklyn; Paul B. Johnson, and Richard S. Moynan, New York.

To FORT DES MOINES, IOWA, for duty, Lieut. Hudson Oliver, Asbury Park.

To FORT OGLETHORPE, for duty, Capt. Douglas Brown, New York.

To FORT TOTTEN, N. Y., for duty, Lieut. W. E. Fitch, New York.

To NEW YORK, to duty examining N. Y. N. G., for tuberculosis and cardiovascular diseases, Lieuts. Thomas Ellis, Geza Kremer, Frank McLean, Thayer A. Smith and Henry C. Thacher, New York.

To EASTERN DEPARTMENT TRANSPORT SERVICE for duty, Lieut. Renato J. Azzari, New York.

To REPORT BY TELEGRAPH TO COMMANDING GENERAL, WESTERN DEPARTMENT, for assignment to duty, Lieut. Harry H. Hemstreet, Brooklyn.

To SYRACUSE, N. Y., for duty, Lieut. W. S. Cooke, Otego.

To Washington, in office of Surgeon-General for duty, Lieut. Hans Zinsser, New York.

NORTH CAROLINA

To Fort Des Moines, Iowa, for duty, Lieut. R. S. Vass, Burlington.

To Report by Telegraph to Commanding General, Western Department, for assignment to duty, Lieut. William H. Boone, Durham.

OHIO

To Fort Benjamin Harrison, for instruction, Lieuts. Harold O. Brown and Stanley G. Odom, Cincinnati.

To Fort Des Moines, Iowa, for duty, Lieut. Romeo A. Johnson, Columbus.

To Report by Telegraph to Commanding General, Southern Department, for assignment to duty, Lieut. James W. Henry, Berlin Crossroads.

OKLAHOMA

To Report by Telegraph to Commanding General, Southern Department, for assignment to duty: Capt. Floyd H. Racer, Woodward; Lieuts. Thomas F. Renfrow, Billings; William R. Barry, Bradley; Alexander B. Montgomery, Checotah; Harman B. McFarland, Cleveland; Montie C. Comer, Clinton; Glenn L. Harker, Elk City; Robert C. McCreery, Erick; George A. Nylund, Gate; Robert E. Calhoun, Hallett; Samuel W. Wilson, Lindsay; Charles R. Ozias, Linn; James L. Patterson, Mutual; J. Lewis Day, Norman; Frank M. Bailey and George Hunter, Oklahoma; Carl Puckett, Pryor; Ernest E. Nunnery, Quinton; Harry McQuown, Stillwater, and George H. Clulow, Tulsa.

OREGON

To Report by Telegraph to Commanding General, Southern Department, for assignment to duty, Lieut. Harold T. Allison, Heppner.

To Report by Telegraph to Commanding General, Western Department, for assignment to duty, Lieuts. Smith J. Mann, Brandon; Ira B. Bartle, North Bend; Benjamin F. DeVore, Oakland; Walter E. Hempstead, Oregon City; Charles Billington, Stanley B. Dickinson and Richard B. Dillehunt, Portland; Eugene Kester, Springfield; Carl J. Bartlett, Vale; Orra E. Patterson, Wendling, and Willis D. Butler, Wilsonville.

PENNSYLVANIA

To Allentown, for duty, Lieuts. Sydney E. Bateman and Robert B. Grimes, Jr., Philadelphia.

To American University, Washington, with Tenth Engineers for duty, Lieuts. Martin G. Barrett, Erie, and Walter A. Blair, Norristown.

To Fort Bayard, N. M., A. and N. Hospital for duty, Lieut. Sidney J. Repplier, Philadelphia.

To Fort Benjamin Harrison, for instruction, Lieuts. Raymond A. Tomassene, Butler; Andrew J. Griest, Harrisburg, and Daniel C. Hankey, Pittsburgh.

To Fort Des Moines, Iowa, for duty, Lieut. De Haven Hickson, Coatesville.

To duty with chief mustering officer, N. G. of Pa., for making examinations in their specialty of personnel, Lieuts. Edward A. Strecker and Samuel Leopold, Philadelphia.

To Duty with Fifth Engineers, N. A., Lieuts. Henry C. Flood and Paul H. Walter, Pittsburgh.

To Monmouth Park, N. J., for duty, Lieut. Douglas MacFarlan, Philadelphia.

To Pittsburgh, as instructor in military roentgenology, Major George C. Johnston, Pittsburgh.

To Washington, for duty, Capt. William H. Walsh, Philadelphia.

So much of Par. 53, S. O. 162, July 14, 1917, War D., as relates to Lieut. Charles H. Haralson, Mont Alto, is revoked.

Resignation of Lieut. Thomas H. Snowwhite, Braddock, is accepted.

PORTO RICO

To Canal Zone, for duty, Lieut. Antonio Mayoral, Ponce.

SOUTH CAROLINA

To Fort Benjamin Harrison, for instruction, Lieut. Albert B. Pavy, Charleston.

To duty at Greenville, S. C., enlisting personnel of Red Cross Ambulance Co. No. 32, Capt. James E. Daniel, Greenville.

Resignation of Capt. William C. P. O'Driscoll, Charleston, is accepted.

SOUTH DAKOTA

To Fort Benjamin Harrison, for instruction, Lieut. Earle D. Quinnell, Sisseton.

TENNESSEE

To Fort Benjamin Harrison, for instruction, Lieuts. James W. McClaran, Jackson, and Henry E. Fraser, Nashville.

To Fort Des Moines, Iowa, for duty, Lieuts. J. D. Carr, Knoxville, and G. W. Bugg, Nashville.

To Report by Telegraph to Commanding General, Western Department, for assignment to duty, Lieut. William H. Daniel, McEwen.

TEXAS

To Fort Benjamin Harrison, Ind., for instruction, Lieuts. Douglas Mebane, Robert K. Simpson and Paul H. Streit, Galveston, and Frank M. Moose, Weatherford.

To Fort Des Moines, Iowa, Lieut. A. E. Punche, Cleburne.

To North Fort Worth, enlisting personnel of Red Cross Ambulance Company No. 40, Lieut. W. S. Horn, Fort Worth.

To Houston, enlisting personnel of Red Cross Ambulance Company No. 36, Lieut. Claude C. Cody, Houston.

To Report by Telegraph to Commanding General, Southern Department, for assignment to duty, Major Thomas G. Howe, Atlanta; Capts. Thomas C. Brooks, Bay City; Newton H. Bowman, Beeville; Woods W. Lynch, Midland; Lieuts. John P. Hower, W. Auda Vee, Abilene; George S. Murphy, Amarillo; Edgar G. Mathis, Austin; George McAlpin Liddell, Axtell; Harry D. Nifong, Britton; Frank T. Blow, Call; C. Hyder, Commerce; Emmett B. Bruton, Hubbard K. Hinde, Ezra H. Mathewson, John J. Trible, Dallas; Herbert O. Darnall, El Paso; E. W. Arnold, Arthur J. Mynatt, Houston; Charles M. Kent, Kenedy; Ernest H. Hamilton, Kilgore; Robert E. Hearn, Mabank; Paul J. Connor, Madisonville; Frank H. Shaw, Marlin; Cranz Nichols, Maxwell; Ellery McR. Outlaw, Montalba; Edward E. Collins, Premont; Forrest F. Fowler, Round Rock; Thomas A. Presely, Runge; Henry S. Keller, Santo Tomas; Henry C. Ricks, Sherman; Henry W. Pickett, Sulphur Springs; Shelby P. Roaten, Swenson; Robert I. Grimes, Sylvester, and William L. Baber, Winnsboro.

UTAH

To Fort Douglas, Utah, Lieut. Kenneth A. Crismon, Salt Lake City.

To Salt Lake City, enlisting personnel of Red Cross Ambulance Company No. 27, Capt. Hugh B. Sprague, Salt Lake City.

VERMONT

To Rutland, enlisting personnel of Red Cross Ambulance Company No. 25, Lieut. W. Stickney, Rutland.

VIRGINIA

To Fort Des Moines, Iowa, Lieut. Douglas B. Johnson, Petersburg.

To Saint Aspah, for duty with Twelfth F. A., Lieut. B. H. Kyle, Lynchburg.

WASHINGTON

To Report by Telegraph to Commanding General, Western Department, for assignment to duty, Capt. William H. Morse, Spokane; Lieuts. Walter R. Johnson, Chehalis; Ezra F. Mertz, Concrete; Earle F. Ristine, Coupeville; Diederich G. Brunjes, Dayton; Charles W. Jones, Elma; Conner O. Reed, Friday Harbor; Frank H. Collins, Goldendale; Hubert L. Miller, McMurray; Nathaniel E. Roberts, Olympia; Shirley Q. Elmore, Pasco; Claire D. Hopper, Richland; Walter Everly and William C. Kintner, Seattle; Charles M. Frazee, William H. Payne, Sedro Wooley, Ralph Hendricks and William M. O'Shea, Spokane; James S. Purdy, Sultan; Frank J. Delaney and Joseph P. Kane, Tacoma.

So much of Par. 42, S. O. 168, July 21, 1917, War Dept., as relates to Capt. Samuel E. Lambert, Spokane, is revoked.

WEST VIRGINIA

To Charleston, enlisting personnel of Red Cross Ambulance Company No. 22, Capt. Timothy L. Barber, Charleston.

WISCONSIN

To Fort Riley, Ga., Lieut. Judson A. Palmer, Arcadia.

# Medical News

(Physicians will confer a favor by sending for this department items of news of more or less general interest; such as relate to society activities, new hospitals, education, public health, etc.)

## ARKANSAS

**Typhoid Fever.**—Several cases of typhoid fever have developed at Paragould, and an investigation of the water and milk supplies of the city has been instituted.

**Books Donated by Medical College.**—Mrs. W. B. Welch, widow of the late Dr. W. B. Welch, Fayetteville, has donated the medical library of Dr. Welch to the University of Arkansas Medical Department, Little Rock.

**State Medical Board Election.**—At the annual meeting of the state medical board, Dr. Francis Taylor Isbell, Horatio, was elected president; Dr. Thomas J. Stout Brinkley, secretary, and Dr. Edward F. Ellis, Fayetteville, treasurer.

**Health Survey Begun.**—The health survey of the territory surrounding Little Rock and Argenta was commenced, July 20, when Surg. Leslie Leon Lumsden and Henry Charles Yarbrough arrived from Washington, D. C., to assist Senior Surg. Claude C. Pierce, San Francisco, U. S. P. H. S., in the sanitary work preparatory to the reception of the soldiers to be stationed there, the twelfth Army cantonment.

**Personal.**—Dr. Samuel Neely Hutchinson, Argenta, has been appointed resident physician of the American Bauxite Company at Bauxite.——Dr. Vernon Robins, city chemist and bacteriologist of Louisville since 1902, has accepted the position of county and city health officer at Helena.——The offices of Drs. John T. Chears, David T. Chears and David P. Terry, Tillar, were destroyed by fire, July 26, with a loss of $3,000.——Dr. Frank Vinsonhaler, Little Rock, has been appointed director of the chapters of Arkansas for the American Red Cross.

## ILLINOIS

**Chicago Graduate Lectures.**—Dr. William Snow Miller, Madison, Wis., of the University of Wisconsin recently delivered a lecture on the "Architecture of the Lung" before

the faculty and students of the graduate summer quarter in medicine of the University of Illinois.

**Sanatorium Patients Strike.**—Because of an alleged food grievance, fifty-five patients of the Chicago Winfield Tuberculosis Sanitarium left the institution, August 3, with multifarious complaints regarding their treatment. The authorities of the sanatorium say that the complaints are groundless.

**Personal.**—Dr. Alice Barlow-Brown, Winnetka, has received an appointment abroad, and expects soon to leave for Compiegne, France, to work under the Chicago branch of the American Fund for French Wounded.——Dr. Harry A. Pattison, Rockford, has been appointed, by the National Association for the Study and Prevention of Tuberculosis, a medical field secretary to organize preventive work in the cantonment camps, and to follow up the men rejected for the Army on account of tuberculosis.

**Medical Military Announcement.**—The medical detachment of the Third Illinois Infantry, mobilized at Rockford, has the following officers: Major Arthur E. Lord, Plano, and Lieuts. Pliny R. Blodgett, Harvard; Harry H. Davis, Monroe Center, and Fred E. Schoppler, Aurora. Two of the sergeants, Hospital Corps, are sons of the late Major Carlton E. Starrett, who served with the regiment during the war with Spain. The Adjutant-General has announced the appointment of the following administrative staff for the Medical Department: Lieut.-Col. Jacob Frank, Chicago; Major John A. Wheeler, Auburn, and Major George U. Lipschulch.

## Chicago

**Should Boil Milk.**—Milk consumers of Chicago have been advised by the health commission to boil milk for a period of several days, on account of the prevalence of anthrax in the Burlington and Hampshire districts of Kane County, from which a large portion of the supply of milk for the city is received.

**Tuberculosis Board Appointed.**—Lieut. Samuel M. Marcus, M. R. C., U. S. Army, formerly a member of the staff of the Cook County Tuberculosis Sanatorium and the Municipal Sanatorium, has been appointed head of the tuberculosis board for the district of Chicago. The examining physicians are Drs. John Ritter, Ethan Allen Gray, Willard W. Dicker, Harry G. Hartt, James Cole, Daniel W. Rogers, George Gardner, William R. Abbott, Edward Heacock, B. Westcott Rogers, Robert Hayes and Nathaniel C. Nelson. The board is being assisted by the following volunteers: Drs. Frederick Tice, Maurice L. Goodkind, William Edward Putz, Jacob W. Bolotin and George Hiram Robbins. Physicians who have had special training in tuberculosis and volunteer to assist for a few hours in the examinations of the enlisted men of the new Army are requested to notify Dr. Marcus by calling telephone Franklin 5510.

## IOWA

**Personal.**—Drs. Henry Matthey and Walter Matthey, Davenport, are reported to have been indicted, August 2, on charges of treason and conspiracy.——Dr. Frank J. Murphy, Sioux City, has succeeded Dr. William Runyon as physician of the Woodbury County Tuberculosis Sanatorium.——Dr. S. D. Boyce, Washington, has been elected medical director of the Grand Army of the Republic of the State of Iowa.

**Hospital Items.**—The hospital at Denison, built about ten years ago, and which passed into the hands of Drs. Carl E. Conn and George A. Hartley, Battle Creek, Mich., and Dr. August H. Rosburg, Denison, will, it is announced, be sold at a referee's sale.——Funds are said to be now available for the new Children's Hospital, Iowa City, which will be erected at a cost of $150,000.——An addition to the Institution for the Blind, Vinton, will be erected at a cost of $20,000.——Contracts for an addition to the Scott County Public Hospital, Davenport, were awarded, July 19.

## LOUISIANA

**State Board Meeting.**—At the meeting of the state board of health, July 20-21, the vice presidency and finance committee of the board were abolished because of the ruling of the attorney-general that neither the officers nor the committee had any legal status. Resolutions were adopted, praising and thanking Dr. Oscar Dowling, president of the board, for his work on health conditions at various government military camps, and also for his research work on malaria.

**Personal.**—Dr. Benjamin F. Gallant, New Orleans, formerly surgeon at the Charity Hospital, has been secured by the Louisiana State Board of Health to make a survey of the Charity Hospital, Shreveport.——Dr. John Gartman Martin, Lake Charles, has resigned as president of the state board of medical examiners, on account of his entrance into the military service.——Dr. Thomas Martin, New Orleans, has resigned as a member of the staff of the Charity Hospital, New Orleans, to accept service in the Army.

**War on Hay-Fever.**—New Orleans has taken actively in hand the prevention of hay-fever, and the mayor has issued the following proclamation:

> Scientific investigations having demonstrated that hay-fever is due to pollen of plants, the majority of which are worthless weeds, the cutting of these weeds at this time will greatly reduce the amount of pollen in the air, and prevent, or at least relieve, the sufferings of hundreds of persons in New Orleans subject to hay-fever. New Orleans is already prominent for its activities and achievements in matters pertaining to health and sanitation, and our citizens, I am sure, will cheerfully and promptly cooperate with the local authorities—the Department of Public Property and the City Board of Health—as well as the American Hay-Fever Prevention Association, in a proper enforcement of the ordinances providing for the extermination of weeds which cause hay-fever.
>
> Now, in order to be of material assistance in the proposed weed-cutting campaign, and as an endorsement of the admirable efforts being made by the American Hay-Fever Prevention Association in this direction, I, Martin Behrman, Mayor of New Orleans, do hereby proclaim Friday, August 10, as "Public Weed-Cutting Day," and urge all citizens to assist in the success of a work the results of which must obviously prove so beneficial to a large percentage of our population.
>
> Given under my hand and the seal of the city of New Orleans this 3rd day of August, 1917. MARTIN BEHRMAN, Mayor.
>
> A true copy: JOHN P. COLEMAN, Secretary to the Mayor.

Six special inspectors have been placed on duty to cover the entire city and to take action against all owners of property who have failed to cut weeds and high grass. The department now has about 250 employees and prisoners at work cutting weeds.

## MARYLAND

**Infantile Paralysis.**—Infantile paralysis has been appearing from time to time in Allegany and Garrett counties, and during the past week two cases were discovered in Baltimore County.

**Correction.**—In THE JOURNAL, June 30, it was erroneously announced that Dr. Joseph W. Roberts, Salisbury, had been appointed superintendent of the Maryland General Hospital, Baltimore. The new appointee is Dr. Joseph J. Roberts, a graduate of the University of Maryland, class of 1916.

**Personal.**—Govenor Harrington has appointed Dr. Edward Bennett Matthews a member of the Maryland Council of Defense, to fill the vacancy caused by the death of Dr. William Bullock Clark. Chairman Gray of the Maryland Council of Defense has appointed Dr. Matthews chairman of the committee on natural resources and highways, to fill the vacancy caused by the death of Dr. Clark.——The War Department has announced the assignment of three contract surgeons of the United States Army to active duty under orders to report in person to the chief mustering officer of the National Guard at Baltimore to ascertain whether any of its members have tuberculosis. The surgeons so assigned are: Wilbur Pledge Stubbs, John A. Leutscher and Harry D. McCarthy.——Dr. Clement A. Penrose, Baltimore, chairman of the Food Economy Commission, addressed a meeting of the Rotary Club during a luncheon at the Hotel Rennert in which he traced the work, and stated that there would be no doubt that the commission would be of the greatest aid in helping the government to prosecute the war to the limit. Dr. Penrose's trip to England in the interest of his work made his talk particularly interesting.——At a recent meeting of the Baltimore Committee of the Women's Homeopathic Base Hospital recently held at the Hotel Emerson, Dr. Marie Letetia Ingram read an address on the work which women physicians are doing in the war.——Dr. Alexander D. McConachie, Baltimore, was operated on for appendicitis, August 1, and is reported to be doing well.——Dr. C. Frank Jones has been appointed assistant health commissioner of Baltimore, and acting head of the division of communicable diseases.

## MICHIGAN

**Board Appointments.**—The governor has reappointed George Barnes, Howell, and Dr. Henry J. Hartz, Detroit, members of the board of trustees of the state tuberculosis sanatorium, Howell.——Dr. Edward A. Ward, Saginaw, has been appointed to succeed Dr. Bruce L. Hayden, Saginaw, as a member of the board of osteopaths, registration and examination.

**Upper Peninsula Physicians Meet.**—The annual meeting of the Upper Peninsula Medical Society was held in Escanaba, August 1-3, under the presidency of Dr. Robert Bennie, Saulte Ste. Marie. The following officers were elected: president, Dr. Harry W. Long, Escanaba; vice presidents, Drs. Henry T. Sethney, Menominee, and Richard Burke, Diorite. The next meeting will be held in Menominee.

## MINNESOTA

**Teaching Fellowships.**—The Graduate School in Medicine of the University of Minnesota offers teaching fellowships in medicine, surgery, obstetrics, pediatrics, nervous and mental diseases and ophthalmology and otolaryngology. These fellowships are to cover courses of three years' duration, with a service of eleven months in each year, under stipends of $500, $750 and $1,000. On satisfactory completion of these fellowships, the degree of Doctor of Science or Doctor of Philosophy, qualified by the specialty selected, is conferred by the university. Application blanks for these fellowships may be secured on request to the dean of the Graduate School, University of Minnesota, Minneapolis.

## MISSOURI

**Personal.**—Lieut. George W. Belshe, M. R. C., U. S. Army, Trenton, while in camp at Fort Riley, Kan., August 7, was struck by lightning and severely injured.——Dr. Jabez N. Jackson, Kansas City, has been appointed a member of the general medical advisory board of the Army.——Dr. William H. Coon, public health commissioner of Massachusetts for ten years past and recently made health director of Kansas City, has entered on his duties, succeeding Dr. Herman E. Pearse, resigned.——Dr. William L. Whittington has severed his connection with the State Hospital for the Insane, St. Joseph.——Dr. Herbert Breyfogle has been certified by the civil service board of Kansas City as physician for the fire department.

## NEW YORK

**Examination of Aviators.**—At a special meeting of the Medical Society of the County of Erie, held at Buffalo Medical College, July 30, Major Isaac Jones, M. R. C., U. S. Army, explained the details of the examination of aviators, illustrated by motion pictures and demonstrations. It is proposed to establish an aviation examination unit in Buffalo.

**Personal.**—Dr. Albert Warren Ferris, Saratoga Springs, medical expert and superintending director for the New York State Reservation Commission, has resigned as chairman of the Saratoga County Home Defense Committee, and has returned to his former position as senior medical officer at Glen Springs.——Dr. Walter S. Goodale, Buffalo, has been appointed superintendent of city hospitals and dispensaries.

**Sanatorium Notes.**—Proposals have been received by the building and supply committee of the board of supervisors of Rensselaer County for the proposed county tuberculosis sanatorium.——The Buffalo Association for the Relief and Control of Tuberculosis is now located in its new building on Swan Street.——The tuberculosis dispensary is also conducted at this address. About 135 patients are examined each month at the dispensary. The association has also a summer camp with accommodations for about eighty patients.

### New York City

**New Knickerbocker Hospital.**—Plans have been filed for a new building for the Knickerbocker Hospital, which will occupy the entire block fronting on the west side of Convent Avenue between One Hundred and Thirtieth and One Hundred and Thirty-First streets. The estimated cost of the new structure is $350,000. The main building will be six stories high. Two floors will be devoted to private wards containing about 200 rooms, and the general ward rooms will provide for about 200 additional patients. The Knickerbocker Hospital was formerly known as the J. Hood Wright Hospital.

**Millions Available for Hospital.**—By an agreement between the executors of the estate of the late James Buchanan Brady and his heirs, the major part of his fortune, estimated at $3,000,000, becomes immediately available for the New York Hospital. This agreement enables the trustees and executors to carry out the testator's plans for the establishment of the James Buchanan Brady Foundation of Urology. Eventually a building will be erected for the foundation to cost about half a million dollars, which will include departments for investigation along chemical, bacteriologic and pathologic lines. The plans for the foundation are in the hands of Dr. Oswald S. Lowsley, who was named by Mr. Brady as director.

**Will Appeal Decision Regarding "Formula Disclosure Ordinance."**—The recent decision of the appellate division of the supreme court declaring invalid the ordinance of the sanitary code requiring manufacturers of "patent medicines" to file the formula of their preparation with the department of health is regarded by the department as a demonstration of the enormous power wielded by "patent medicine" interests, and will be appealed. It is pointed out that the courts have upheld other sections of the sanitary code, and that there is no question of the validity of this section. Pending the final decision on the section in question, the department will continue its war on "patent medicine" fakers under other sections of the sanitary code.

**Nutrition Clinics.**—As the result of a cooperative investigation carried on by the Bureau of Child Hygiene of the department of health and the New York Association for Improving the Condition of the Poor, five clinics devoted to the care of cases of defective nutrition have been established in this city. These clinics are intended mainly for the treatment and supervision of the large number of schoolchildren who show marked evidence of defective nutrition. A large part of the work will be educational in character, and instruction of the mothers in the proper feeding of the family will play an important rôle. These five clinics are as follows: Bellevue, under the direction of Dr. Charles Hendee Smith; Bowling Green, 98 Washington Street, under Dr. John L. Kantor; Cornell, under Dr. May G. Wilson; Post-Graduate, under Dr. Morris Stark; Brooklyn Association for Improving the Condition of the Poor, under Dr. Oswald Joerg.

**The Feeding of Children from 2 to 7 Years Old.**—The health department, observing that the many leaflets on the subject of dietetics now being published give very little attention to an important group in the community, namely, children between the ages of 2 and 7 years, requested four members of the department's advisory council, Drs. Luther Emmett Holt, Graham Lusk, Linnaeus E. La Fetra and Godfrey R. Pisek, to meet this need. As a result of their work, an authoritative statement on this subject has been published in the *Weekly Bulletin of the Department of Health*, July 28. The leaflet is designed chiefly for the use of visiting nurses, social service workers and others who come into contact with those most in need of instruction in food economics. It gives the amount of food required, the proportion of the various food elements, the cost of various articles of diet per calorie, some points on cooking, and sample diets for children from 2 to 4 and from 5 to 7 years of age.

## NORTH DAKOTA

**Personal.**—Dr. Arley J. Ostrander has been appointed junior surgeon for the Minneapolis, St. Paul and Saulte Ste. Marie Railway at Enderlin.——Dr. Ellis S. Swarthout, Lisbon, has been commissioned first lieutenant in the medical corps, North Dakota National Guard.

**Honor to Military-Medical Men.**—The medical fraternity of Minot tendered a banquet, at the Leland Hotel, July 27, to Lieuts. Alexander J. McCannel, and Johnston C. Jackman, and Major Frank E. Wheelon, M. C., North Dakota National Guard, who have been assigned to the Second Infantry.

## OHIO

**Akron Opens Municipal Dispensary.**—The Municipal Dispensary, Akron, was opened, August 6, in the Organized Charities Building. Dr. Fred Read is in temporary charge of the institution.——A municipal tuberculosis clinic will be opened this month, and a municipal nursing bureau is established.

**Building for Doctors and Dentists.**—The Physicians and Dentists' Building Company was incorporated recently for the purpose of erecting a sixteen-story building, fourteen stories of which will be devoted to offices for physicians and dentists. The other two floors will contain clinic rooms and assembly hall and club rooms.

**New Health Council.**—A law abolishing the state board of health and creating a state department of health became effective. The new state council of health is composed of Mr. R. M. Calfee, an attorney of Cleveland, Drs. George D. Lummis, Middletown, and Charles O. Probst, Columbus, and Dr. W. J. Jones, a dentist of Columbus. Dr. Lummis has been designated as chairman of the board, which held its first meeting in the governor's office, August 3.

**Examiners for Aviators Appointed.**—Dr. Christian R. Holmes, Cincinnati, has been appointed director of the local medical examining board for the Aviation Corps. The outdoor clinic of the Cincinnati General Hospital will be utilized for examinations. Dr. Holmes will be assisted by the following staff: Samuel Iglauer, Walter E. Murphy, Charles C. Jones, Horace F. Tangeman, Edward King, Robert Sattler, Victor Ray, Derrick Tilton Vail, Fred W. Vail, Wylie McLean Ayres, Mark A. Brown, A. C. Bachmeyer, Oscar Berghausen, E. A. Wagner, A. E. Osmond, Julian Benjamin and Herman H. Hoppe.

**Personal.**—Dr. Henry Baldwin, Xenia, has resigned as superintendent of the district tuberculosis hospital, Springfield.——Dr. John Darby, Cleveland, has been appointed assistant lieutenant to Col. Joseph A. Hall, chief surgeon, M. C., Ohio N. G. It is expected that Dr. Darby will be assigned to duty as chief sanitary officer.——Dr. David E. Rouse has been appointed chief sanitary officer of the sanitation district about Camp Sherman, the Chillicothe cantonment.——Dr. Don Hughes, Findlay, has been reelected Medical State Director of the Modern Woodmen of America.——Dr. E. H. Caldwell, Vinton, has been appointed physician at the Boys' Industrial School, Lancaster, succeeding Dr. J. W. Clouse, resigned.——Dr. Howell B. Vail, Scio, was shot and seriously wounded by an insane man at Scio, July 26.——Charges of blackmail filed against Dr. George H. Matson, Columbus, secretary of the state medical board, were proved unfounded after the trial, held July 25. The charge against Dr. Matson was based on his activities in prosecuting charges against a Cleveland man who was indicted for the illegal practice of medicine, last May.——Dr. John James McShane, head of the health board of Akron, has resigned to accept a position with the Illinois State Board of Health.——Dr. Courtney P. Grover, surgeon at the National Military Home, Dayton, has resigned to accept a position as surgeon at the Wilbur Wright aviation field.——Capt. Earle W. Cliffe, M. C., Ohio N. G., Youngstown, has been assigned to duty with the Tenth Ohio Infantry.

## PENNSYLVANIA

**Homeopaths Offer Services.**—At the annual meeting of the state homeopathic society, held at the Bellevue-Stratford, August 8, fifteen physicians offered their services to the Medical Reserve Corps of the Army.

**Organize Medical Club.**—The Thompson Medical Club was organized at Franklin, July 30, at a dinner given to Drs. Ardus C. Thompson and Edgar V. Thompson, M. R. C., U. S. Army. Dr. Louis E. McBride was elected chairman; Dr. Alexander M. Brown, secretary, and Dr. Harry F. McDowell, treasurer.

**No Fear of Smallpox at Camp.**—Although the wife of Lieutenant McCollough has been stricken with smallpox, no apprehension is felt by officers of the Army Ambulance Corps concentration camp. All the recruits were vaccinated shortly after they reached camp, and Mrs. McCollough never visited the camp.

**Ambulance Troopers Examined.**—August 6, work was begun by a War Department board of five physicians examining all the soldiers of the United States Ambulance Camp at Allentown. The board consists of Drs. Rae S. Dorsett, head surgeon, Albert E. Blackburn, John R. Robrecht, Louis Jurist and William S. Wray, all of Philadelphia.

**Personal.**—Dr. Edward L. Davis, Berwick, recently underwent operation in the Berwick Hospital.——Dr. Evan W. Evans, Easton, is reported to be critically ill in Lankenau Hospital, Philadelphia.——Dr. Francis M. B. Schramm, Johnstown, city bacteriologist, who has been ill with pneumonia, has resumed his duties with the city health department.——The salary of Dr. Richard G. Burns, Pittsburgh, acting director of the Pittsburgh Department of Health, has been increased to $7,000.——Dr. Charles F. Furnee, Harrisburg, has been commissioned captain in the Medical Corps, Pa. N. G., and assigned to the Sixteenth Infantry.

### Philadelphia

**Veterinarians to Aid Army.**—C. J. Marshall, Philadelphia, state veterinarian, and Louis A. Klein, dean of the School of Veterinary Medicine at the University of Pennsylvania, have been appointed members of an advisory board by Surg.-Gen. William C. Gorgas, Washington, D. C.

**Decrease in Whooping Cough Epidemic.**—The report of the health bureau for the week ending August 11 shows 152 cases of whooping cough as compared with 236 for the preceding week. Dr. Andrew A. Cairns, chief medical inspector, believes the cause of the spread of the disease is the failure of physicians to report cases of the disease.

**Red Cross Hospital.**—August 7, work of demolition of the Medico-Chirurgical College was begun. Four buildings of this institution, including a part of the hospital, will be razed, but the main portion of the latter will be reserved during the war, where the American Red Cross will establish the first general Red Cross hospital in this country. It will be known as Red Cross General Hospital No. 1, and $20,000 has been appropriated for the current expenses. The building will be altered and reconstructed, and will contain 250 beds.

**Baby Saving Station to Be Built.**—A baby health center and dispensary is to be established at Seventh and DeLancey Place by the Babies Hospital. Eight dwellings on the east side of Seventh Street have been purchased as a site for a large four-story "airolite" building and yard that will involve an expenditure of almost $100,000. According to plans for the new building, it will be the most modern and best equipped center in the country. There will be a roof garden where mothers may take their babies on hot summer nights, rooms for daily clinics for sick babies, for prenatal clinics, for prophylatic clinics, lecture hall and laboratories. Home supply and social service departments will be important branches of the work. The home supply department will provide bed clothing, cribs and everything pertaining to baby comfort to the poorer people of the congested districts of the city.

**Personal.**—Capt. Milton H. Fussell, First Lieut. David Riesman and Lieut. Augustus A. Eshner have been ordered to Gettysburg to examine men for tuberculosis. The three physicians later will work in the Army cantonments to prevent tuberculosis from developing among officers or men.——Dr. Alexander C. Abbott, member of the local board of health, and professor of hygiene at the University of Pennsylvania Medical School, has been commissioned a captain in the Medical Reserve Corps, and will examine all the new cantonments for the Army to insure perfect sanitation.——Dr. John D. McLean has been appointed to succeed Dr. Abbott on the bureau of health.——Major William F. Manges, chief roentgenologist of the Jefferson Medical College, is conducting a school for the instruction of members of the Medical Reserve Corps in Roentgen-ray work. The school is held in the basement of the Jefferson Hospital, and six physicians are in the first class.——Dr. John Rouse, Fox Chase, was severely injured in an automobile accident near Jenkintown, August 7.——Dr. Asa F. Copeland has been appointed by the mayor as outdoor physician of the Bureau of Charities, with a salary of $540.——Dr. Theodore H. Weisenburg has been appointed to the National Committee on Mental Hygiene.

## CANADA

**Hospital News.**—A new Canadian military hospital has been opened at Liverpool, England. It receives soldiers whom the medical board has slated for "further treatment in Canada." Troops fresh from Canada, who fall sick, will also be detained in that institution. Lieut.-Col. J. L. Biggar is the commanding officer. He went to England with the Thirteenth Field Ambulance from Victoria, B. C.——Capt. A. W. Wakefield, C. A. M. C., who was on board a hospital ship which ran ashore near Halifax, N. C., recently, has arrived in Montreal. Captain Wakefield went overseas with the Newfoundland Medical Corps at the beginning of the war, but was soon transferred to the Royal Army Medical Corps.

**Personal.**—Dr. A. S. Moorhead, F. R. C. S., Toronto, has sailed for France, having accepted an appointment in the Royal Army Medical Corps, in the surgical department of one of the casualty hospitals under Dr. Herbert A. Bruce.——Surg.-Gen. George S. Ryerson, Toronto, is spending the summer at Tadousac, Que.——Lieut.-Col. E. B. Hardy, Toronto, O. C. Toronto Military Base Hospital, has been elected president of the Toronto branch of the Great War Veterans' Association of Canada.——Lieut.-Col. D. W. McPherson, Toronto, officer commanding the Ontario Military Hospital, Orpington, England, has been created a C. M. G.——Capt. Andrew Macphail, Montreal, editor of the *Journal of the Canadian Medical Association* and the *University Magazine*, is the second Canadian physician ever honored with an invitation to address the Cavendish Society, Sir William Osler having been the other.——Surg. Major Napier Keefer, M.D., Toronto (retired), has sent to King George a gift of $47,500, which is to be distributed as follows: Star and Garter Home for Paralyzed Soldiers, $10,000; Nurse Cavell Homes, $10,000; Auxiliary Officers' Consumption Hospital, $5,000; Prisoners' of War Fund, $2,500; orthopedic treatment,

$10,000; treatment of deaf soldiers, $10,000.——Capt. Frank Muir Walker, M.B., University of Toronto, 1913, has been awarded the Military Cross for gallantry and devotion to duty under heavy fire. He went through a heavy barrage to some wounded men and tended them in the open for an hour. His home is in Stoney Creek, Ont.——Major Harold Parsons, M.D., Toronto, who has been with the University of Toronto Base Hospital at Saloniki since October, 1915, reached London, England, July 1.——Dr. Ingersoll Olmstead, Hamilton, Ont., is spending the summer in Cape Breton, N. S.

## GENERAL

**Personal.**—Dr. Thomas W. Huntington, San Francisco, has been appointed a member of the committee to go to Italy and advise with the military authorities on Red Cross matters. ——Dr. Wilfred T. Grenfell of Labrador has been spending a few days in London after three months in hospitals on the western front.

**Next Examination of National Board.**—The third examination of the National Board of Medical Examiners will be held in Chicago, Oct. 10-18, 1917. It is contemplated that another examination will be held in New York in the early part of December. The secretary of the board is Dr. John S. Rodman, 2106 Walnut Street, Philadelphia.

**Tri-State Society Meeting.**—The annual meeting of the Tri-State District Medical Society of Illinois, Iowa and Missouri will be held at Dubuque, Iowa, September 4-6. The headquarters are to be at the Hotel Julian. At the annual meeting, held on the third evening, Dr. Arthur D. Bevan, Chicago, will preside as toastmaster, and the governors of the three states, the presidents of the three medical societies, and the president of the American Medical Association are expected to be present.

**Society of Military Surgeons.**—It is planned by the executive council of the Association of Military Surgeons of the United States to hold a meeting, October 8, at Indianapolis. The meeting of the society, which was to have been held in Chicago last year, was called off because of the absence of many of the members on the Mexican frontier. It is problematical whether a large proportion of the membership of the society will be able to be present at Indianapolis on account of existing war conditions.

**Bequests and Donations.**—The following bequests and donations have recently been announced:

German Hospital, Philadelphia, $20,000; Philadelphia Polyclinic and College for Graduates in Medicine, and Philadelphia Lying-In Charity, each $10,000, by the will of William B. Baltz, Devon, Pa.

Episcopal Hospital, Philadelphia, $5,000; Samaritan and Children's hospitals, and Philadelphia Home for Incurables, each $1,000, by the will of Harriet Shaw.

St. Mary's Free Hospital and the Sea Breeze Association for Improving the Condition of the Poor, New York; Morristown (N. J.) Memorial Hospital, and All Souls' Hospital, each $10,000, by the will of Annie A. Peckham.

## PARIS LETTER

Paris, July 26, 1917.

### The War

#### KIDNEY WOUNDS CAUSED BY WAR PROJECTILES

Dr. Barnsby has reported to the Société de chirurgie de Paris five cases of isolated wounds of the kidney that he has encountered, purposely leaving out of account the renal lesions that are a frequent complication of penetrating wounds of the abdomen. Primary hematuria may be divided into two classes: (1) either the hematuria is slight and the general health good, in which case one should postpone operation, since a cure is usually effected spontaneously, or (2) the hematuria is abundant and the general condition grave, in which case operation should be resorted to. Nephrectomy is not indicated except in cases of rupture of the kidney, which makes conservation impossible. Partial lesions of the parenchyma, whether of the convex border or of the inferior pole (provided the section is not complete), should cause the surgeon to reconsider and to adopt conservation. When there are repeated hematurias, we usually have to deal with a projectile which has become embedded in the parenchyma. The methods of localization (*repérage*)—which have been so perfected in our day—should lead to the removal of the projectile and to conservation of that organ. The method of choice is without doubt the extraction under intermittent roentgenoscopic control, which permits the exteriorization of the kidney, a conservative incision, removal of the projectile and a diminution of the traumatism. The use of calipers, since they do not permit exteriorization, makes the operation laborious. When there is a primary dribbling of the urine or a traumatic urinary fistula, it is evidently a serious case which points to a lesion of the renal pelvis, or the calices majores. Sometimes there are cases in which nephrectomy is unavoidable, but one should not reach this conclusion hastily. If the surgeon has lost no precious time, he can incise and drain, curet cautiously, cauterize several times, and refrain from interfering radically until all attempts at conservation have failed. In these conservative operations one must learn to act with caution. Any exteriorization of the kidney which should prove laborious, in cases of this kind, would be almost sure to lead the surgeon to a total excision. Barnsby concludes his report by saying that one can carry conservation very far when it is a question of isolated kidney wounds.

#### STATUS OF MEDICAL STUDENTS

According to a recent decree, medical students not matriculated in the Ecole principale du Service de Santé de la marine de Bordeaux who, at the time of mobilization, had twelve credits toward their doctor's degree may be appointed to the rank of médecin auxiliaire de 2-e classe (physician's assistant) after the completion of at least one year of service in the capacity of médecin auxiliaire de 3-e classe of the navy.

#### AMERICAN AND FRENCH RED CROSS

The Central Committee of the French Red Cross, wishing to welcome the American Red Cross, invited its representatives to a friendly gathering which was held at the headquarters of the Société de secours aux blessés militaires. Among the invited guests were the American ambassador, Mr. Sharp, and wife, and Major Murphy, the American Red Cross commissioner for Europe, together with the officers of his staff, who were received by the delegates of the three societies of which the French Red Cross is composed. Admiral Touchard was the spokesman of the Central Committee of the Red Cross, and in its name gave expression to the gratitude of France to the United States. Mr. Sharp replied to this address, saying that the American Red Cross felt itself deeply indebted to its French co-workers for the warm welcome that had been accorded to it.

#### THE AMERICAN AMBULANCE CORPS AT NEUILLY

The closing ceremonies of the American ambulance corps took place recently at the lycée Pasteur at Neuilly, and was presided over by Justin Godart, undersecretary of state for the military medical service. Among the distinguished guests were Mr. Sharp, the American ambassador; Mr. Benet, president of the administrative council of the ambulance; Dr. Winchester du Bouchet, chief surgeon; Major Peed; Medical Inspectors Lannes and Sieur, and others. Mr. Benet, in turning over the American hospital at Neuilly to the government of the United States, said that this occasion, after three years' effort, would bring sadness to the founders if this cession did not mark the entrance of the great American republic into the conflict. M. Justin Godart warmly thanked the friends of France for their devotion.

A few days before these closing ceremonies were held, General Pershing, commander-in-chief of the American expeditionary force, took occasion to visit the American ambulance at Neuilly. He was conducted through the hospital by the chief surgeon, Dr. du Bouchet, and inspected the different services: the operating rooms, the laundry, the pharmacy, the kitchens, the apartments reserved for wounded officers, those set apart for the soldiers, and lastly, the rooms for mechanotherapy. On leaving the hospital, General Pershing warmly congratulated Dr. du Bouchet on the perfect condition in which the hospital was kept.

#### FRANCO-AMERICAN CELEBRATION

A brilliant Franco-American celebration organized for the benefit of the Society for the Protection of Invalid Soldiers took place recently at the Trocadéro in the presence of Mr. Sharp, American ambassador; General Pershing; M. Viviani, minister of justice; M. Painlevé, minister of war, and others.

#### SPANISH MEDICAL MISSION VISITS FRANCE

A very important medical mission accredited by the Spanish minister of foreign affairs arrived at Paris recently. The mission intends to leave shortly for a visit to the hospitals on the French front and later to those on the British front. The chairman of this mission is Dr. Martinez Vargas, professor at the Facultad de medicina de Barcelona, and among the members of the party are Dr. Raventos, delegate of the Academia de medicina de Barcelona; Dr. Turo, physician of the "dispensaire français" of Barcelona; Professor Peyri;

Agrégé Professors Vallori and Moralès; Professors Firmat and Nogueras of the Facultad de medicina de Salamanca, and a great number of physicians of Majorca, Bilboa, Barcelona, and Salamanca.

This Spanish mission was received by a number of distinguished scientists, among whom we may mention Professors d'Arsonval and Moureu of the Académie des Sciences and of the Académie de médecine; Professors Robin and Gilbert of the Académie de médecine; E. Perrier, director of the Muséum, member of the Académie des sciences, and others.

#### ALIMENTARY HYGIENE

The minister of food control has received a delegation of the Société scientifique d'hygiène, which consisted of Professors Richet, Gley, and others. The delegation called the attention of the minister to the fact that the scientific principles on which the process of nutrition in man is based should lie at the basis of the questions pertaining to food control. This delegation also informed the minister that the Société scientifique d'hygiène alimentaire was at his disposal as regards information of a scientific nature to be furnished the administrators charged with the study of food questions and with the introduction of food restrictions. If there were any measures to be adopted for which it would be well to prepare the public in advance, the society would always be ready to lend its aid in the form of lectures or publications explaining the situation in simple language.

### Personal

Dr. Moureu, member of the Académie des sciences, and professor at the Ecole superieure de pharmacie de Paris, has been appointed professor of organic chemistry at the Collège de France.

## LONDON LETTER

LONDON, July 31, 1917.

### The War

#### THE HEALTH OF MUNITION WORKERS

An important report to the government Committee on the Health of Munition Workers has just been published. Dr. H. M. Vernon has conducted an elaborate investigation for the committee, the members of which realize that the data at their disposal are not yet ample enough to permit them to express a final judgment on the whole question of hours of labor in relation to output, on the one hand, and the well-being of the employes, on the other. But they are strongly of opinion that the evidence collected by Dr. Vernon, and his conclusions merit the immediate and earnest consideration of all concerned in industrial organization at the present time. (*a*) Observations extending over a period of thirteen and one-half months on the output of workers employed in making fuses showed that a reduction of working hours was associated with an increase of production both relative and absolute. The rate of production changed gradually, and did not reach an equilibrium value before the expiration of four months. Thereafter it remained steady during the period of from three and one-half to five months during which it was observed. The gradual change negatives the suggestion that the effect was a mere consequence of the desire to earn the same weekly wage as before the hours were shortened. (*b*) Owing to the reduction of the working time first by a change from a twelve hour day to a ten hour day, and subsequently by the abolition of Sunday labor, it was possible to compare output under three conditions. The group of women (numbering from eighty to one hundred) engaged in the moderately heavy labor of turning aluminum fuse bodies provided the following comparative results: (1) When actually working 66 hours a week and nominally 74.8 hours, their relative hourly production was 100 and their relative gross production 100. (2) When actually working 54.8 hours and nominally working from 58.5 to 66 hours, their hourly production was 134 and their gross production 111. (3) When actually working 45.6 hours and nominally working from 49.5 to 58.5 hours, their hourly production was 158 and their gross production 109. It is to be inferred, therefore, that had these women been working uniformly, a nominal 50 hour week their gross output would have been as large as when they were working a nominal 66 hour week, and considerably greater than when they were working a 77 hour week. In other words, a considerable addition to the leisure time of the operatives would have substantially improved the total output of the factory. (*c*) A group of forty women engaged in the light labor of milling a screw thread on the fuse bodies improved their gross output by 2 per cent. when actually working 54.8 hours a week, the standard being their gross output when working 64.9 hours per week. A further reduction of actual working hours to 48.1 resulted in such an improvement of hourly output that the gross output was 1 per cent. less than when the actual working time was 16.8 hours more. (*d*) A group of fifty-six men engaged in the heavy labor of sizing the fuse bodies improved their hourly output by 37 per cent. and their gross output by 21 per cent. when actually working 51.2 hours, the standards being the hourly and gross outputs observed when the actual weekly hours were 58.2. (*e*) Fifteen youths engaged in the light labor of boring top caps by means of automatic machines produced only 3 per cent. less output when their actual weekly hours of work were 54.5 hours than when they were 72.5 hours. (*f*) A part of the improvement in output was due to the workers starting work more promptly when on shorter hours. At one period the women engaged in turning fuse bodies lost on the average thirty-seven minutes daily by starting work after, and stopping before, the nominal time. Nine months later, when their hourly output was 25 per cent. better, they lost only twenty-six and one-half minutes daily in these ways. (*g*) A rest from work on Sunday is followed by a relatively low output on Monday, and this output steadily rises in the course of the week, owing to the increased efficiency produced by practice. Generally, the cumulative effects of fatigue neutralize and overpower this increased efficiency, and the output may fall after the second day (or night) of the working week if the hours are long and the work laborious, or not till after the third, fourth or even fifth day, if the hours are shorter. In the absence of a Sunday rest, the fatigued worker has no opportunity for complete recuperation, and his output, though more uniform, remains permanently at a lower level than that shown on Monday by a worker who has rested on Sunday.

#### THE UNITED STATES MEDICAL STAFF ON THE BRITISH FRONT

The impression made by the American physicians, nurses and orderlies who arrived on the British front in advance of their fighting men and took over six large base hospitals is thus described by Mr. Philip Gibbs, the war correspondent of the *Daily Telegraph*: "The American intonation is a new note on the western front, where the voices of many races mingle. It brings a new type of manhood on to this stage of war, and one feels instantly the freshness and the vigor of it. They are quiet, businesslike, alert fellows, these young college men and other volunteers who have come out as orderlies and stretcherbearers and staff clerks with the American Medical Corps. The members of the administrative and professional staffs, surgeons and physicians from great American hospitals have settled down to this work of taking over British hospitals—not an easy task when wounded are coming in all the time—with an orderly method, a complete absence of fuss and red tape, which shows the quality of their character, direct, quick in the grasp of principles and details, getting down to the job in hand without unnecessary words or worry. So it seemed to me. Some of these men have seen service in the Philippines. All of them have had long experience in American hospitals, where the wreckage of human life in peace has trained them for the greater wreckage of war. All of these have a look in their eyes, as though conscious of the enormous tragedy into which they have come, and of the greatness of the task they have undertaken; yet bright and cheerful, and sure of themselves."

#### MEDICAL JOURNALS AND THE WAR

It is nearly three years since we entered the greatest of the world's wars, during which we have had to create an army adequate for the occasion, which meant summoning the whole of the young men of the country. Needless to say, our national life has been greatly modified; but the remarkable fact is that the change has not been greater. This fact is exemplified by our medical journals. The price of paper is now four times what it was before the war. Advertising is greatly reduced. Subscription lists necessarily diminish, for not only is there what may be called the normal death rate of subscribers, but nearly half the profession is at the front and therefore less likely to subscribe. Even the physicians killed in action form an item. But so far only one medical journal has ceased publication. The others are diminished in size to about one half. Thus the half-yearly volume of the *Lancet* is now about 1,000 pages, while before the war it was 1,800. In some cases the form of publication has been altered. Thus, the *Clinical Journal* is published monthly instead of weekly, and the *British Journal of Children's Diseases* quarterly instead of monthly. The causes of reduction of size are sev-

eral. Not only is paper much more expensive, but printing, engraving and all other costs have increased. Moreover, the withdrawal of such a large proportion of the medical profession from civil practice has caused those who remain to be exceedingly busy, with little time for writing. In spite of the great flow of "war" articles, the total output is diminished.

### FOOD CONTROL

Lord Rhondda, the food controller, is introducing an elaborate system to prevent as far as possible increase in the cost of food. While the cost of food has on an average rather more than doubled, the cost of living to the wage earner has increased by over 75 per cent. In some cases wages have advanced sufficiently to cover the increased cost of living, while in others there has been only comparatively small advance and in some cases none at all. By the exercise of a little self-sacrifice and the avoidance of waste on the part of the community generally, it is possible both to maintain adequate supplies of food and to reduce substantially the price of the chief necessaries of life. The submarine menace has so far led to little deprivation on our part, but the effect of the loss of tonnage is cumulative, and until the shipbuilding program of the Allies results in replacing vessels as rapidly as they are sunk, we shall not be out of danger. The government policy is to fix the prices of those articles of prime necessity over the supply of which it can obtain effective control at all stages, from the producer down to the retailer. Such prices will, as far as possible, be fixed on the principle of allowing a reasonable prewar profit for those engaged in the production and distribution of the particular commodity. Every effort will be made to prevent speculation, and unnecessary middlemen will be eliminated. Existing agencies will be utilized for the purposes of distribution under license and control, and under the supervision of a local food controller to be appointed by the local authorities. Bread is by far the most important food to be dealt with. The 4 pound loaf now costs 24 cents. The government proposes to reduce the price to 18 cents, which will go far to ease the situation in many thousands of poor homes. It purposes to attain this end by taking over all the flour mills of any importance, as many have been taken over already. From the mills flour will be sold to the bakers at a uniform price calculated to correspond with the price of 18 cents for a quartern loaf. Bakers obtaining flour at that price will be expected to sell the loaf over the counter at a maximum price of 18 cents, but they will be allowed to make an additional charge for delivery and in cases in which they give credit. They will be allowed to charge more for cash counter sales only if they prove to the satisfaction of the ministry or local authorities that they have had specially high working costs. The amount realized by the millers from the bakers for flour at the uniform price will be met by the subsidy from the exchequer. The amount of that subsidy cannot be definitely estimated because the price which will have to be paid for imported wheat is still uncertain. Those in other parts of the world who are not under the control of the Ministry of Food will have the highest price they can exact from the various competitors for the food which they provide, and the British government cannot afford to risk the loss of any essential article of food by refusing to pay whatever price will be necessary in order to secure it. How the government will cheapen the article when it has secured it is a question of ways and means, and the government's intention is to take the short cut by establishing the price by law, reducing the price to the poor, and making up the difference from the exchequer.

The fixing of the price of meat has presented special difficulties owing to the unprecendented rise in the cost of storage during the last few months. Steps are being taken to determine what margin between the price of cattle and the price of beef will yield a dealer or butcher a fair profit. Great attention has been paid to developing national economy in food consumption. An important step will be the establishment, when local circumstances suggest that they are required, of central or communal kitchens. They will be run with the idea of economizing and not as charitable institutions. Economies both in food and in coal can be effected by this means.

### MEDICAL EXAMINATION OF RECRUITS TRANSFERRED TO A CIVILIAN AUTHORITY

Considerable dissatisfaction has arisen with regard to the medical examination of recruits by the present boards. A man rejected at one examination has been passed as quite fit at a subsequent examination. The greatest cause of complaint is that the reports of civilian physicians are overridden by army surgeons. A committee appointed by the government to investigate the subject has reported that in view of the evidence a change of system should be made at once and that the whole organization of recruiting medical boards and of the medical examination and reexamination should be transferred from the War Office to the Local Government Board, the body which controls the civil medical administration of the country.

Sir James Mackenzie, in giving evidence before the committee, said that before the war army surgeons dealt with men who were fit and wanted to join the army, which was an easy matter. Now individuals of impaired health are recruited for the lower classifications. Army surgeons are not trained to deal with men of that description. Mistakes and differences of opinion are bound to occur. "As a young man" he said, "I told people with heart murmurs that they were in a bad way, but they did not die, and I began to separate the murmurs—the innocent ones from those of importance. Some physicians have ignored this advance, and that is how you sometimes get a man who has been rejected passed 'A' by a physician who recognizes that a murmur is of no importance. Then it comes as an enormous shock to the man who is passed 'A.'" Sir James Mackenzie is able to distinguish the important from the unimportant murmurs with fair certainty, and thinks that the ordinary physician, if he had not been spoiled, could be taught to do the same. Some murmurs might mean anything, and the man might be in perfect health. He would pass a man "A" without hesitation if an innocent murmur was his only trouble. He had seen a lad who had been rejected on account of heart murmurs. He found that he was the leading athlete of his school, and that the following day he won a prize for running the longest race in record time. Men were continually being rejected for life insurance through heart murmurs. He gave a certificate to a man who had been rejected seven times. That man had now been in the fighting and was quite well.

## Marriages

LIEUT. JARRETT M. HUDDLESTON, M. O. R. C., U. S. Army, Washington Barracks, to Miss Helen MacLain of Asheville, N. C., at Washington, D. C., July 26.

LIEUT. CHARLES RAY TOMPKINS, M. O. R. C., U. S. Army, Chicago, to Miss Jessie McLean of Grafton, N. D., at Chicago, recently.

SAMUEL BENJAMIN NICKELS, M.D., Big Stone Gap, Va., to Miss Louise Parsons of near Petersburg, Va., at Richmond, Va., July 28.

ASST.-SURG. DOZIER GIBBS, U. S. Navy, Washington, D. C., to Mrs. Lulu May Lacy of Nashville, Tenn., at Portsmouth, Va., July 28.

ASST.-SURG. DANIEL TRIGG, U. S. Navy, Norfolk, Va., to Miss Mary Balmer of Hampton, Va., at Norfolk, Va., July 26.

EVERETT MONROE ELLISON, M.D., Washington, D. C., to Miss Alberta Bayne Huntt of Alexandria, Va., Dec. 30, 1916.

EARL KENDALL HOLT, M.D., Logansport, Ind., to Pearl Evelyn Hyatt, M.D., of Syracuse, N. Y., at Cincinnati, July 31.

WILLIAM DAVID CLELAND, M.D., Harlansburg, Pa., to Miss Mary G. Long of New Wilmington, Pa., July 24.

SAMUEL ARTHUR KLEGER, M.D., New York City, to Miss Elizabeth Edna McColley of Minneapolis, July 3.

ASST.-SURG. STEPHEN ROY MILLS, U. S. Navy, to Miss Nelle Layton Kinter, both of Bradford, Pa., July 25.

HERMAN JOHN BOLLINGER, M.D., Baltimore, to Miss Fannie Jeanette Millahubt of Wichita, Kan., July 29.

LEON WOODFORD KELSO, M.D., Paxton, Ill., to Miss Eleanor Watts of Carlinville, Ill., at Paxton, July 21.

GEORGE RUDOLPH VEHRS, M.D., to Miss Esther Genieve Stoddard, both of La Grande, Ore., June 5.

ASST.-SURG. EDWARD A. BROWN, U. S. Navy, to Miss Lucile Dodson, at Norfolk, Va., July 21.

STEPHEN EARLE VOSBURGH, M.D., to Miss Ruth Cartridge, both of Augusta, Me., Aug. 1.

ROBERT H HERBST, M.D., Chicago, to Miss Marion Mable Steeves of Boston, recently.

LEO KILLIAN, M.D., Blair, Neb., to Miss Lois Peters, at St. Louis, recently.

# Deaths

**Linus E. Russell, M.D.,** Springfield, Ohio; Eclectic Medical Institute, Cincinnati, 1872; aged 68; formerly professor of clinical surgery and operative gynecology in his alma mater; surgeon to the Seton Hospital, and local surgeon of the Big Four and Panhandle System; associate editor of the *Eclectic Medical Journal;* who for seventeen years maintained an office in Cincinnati; died at his home, August 2, from cerebral hemorrhage.

**Lieut. V. A. Magenheimer,** M. O. R. C., U. S. Army, Mooresville, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1898; aged 42; a member of the Indiana State Medical Association; on duty at Fort Benjamin Harrison; died in the post hospital, July 29, from injuries received in a collision between an automobile in which he was riding and an interurban car, near Fort Benjamin Harrison.

**Lieut. Augustus Abraham Greenberg,** M. O. R. C., U. S. Army; Brooklyn; Eclectic Medical College of the City of New York, 1904; Long Island College Hospital, Brooklyn, 1909; aged 39; a member of the visiting staff of Gouverneur, Mount Sinai and Beth Israel hospitals; died in the Jewish Hospital, Brooklyn, August 6, from septicemia, which, it is said, followed an infected mosquito bite.

**William L. Dickinson, M.D.,** Saginaw, Mich.; University of Buffalo, N. Y., 1879; aged 53; a Fellow of the American Medical Association; formerly professor of rectal diseases in the Michigan College of Medicine and Surgery, Detroit; rectal surgeon to the Woman's Hospital, Saginaw; died at his home, June 8, from leukemia.

**Charles Horace Lincoln Moseley, M.D.,** Brooklyn; New York University, New York City, 1890; aged 52; founder of the Central Hospital, Brooklyn, later known as the Bushwick Hospital; a member of the visiting staff of the Jamaica Hospital and German Hospital, Brooklyn; died in Poughkeepsie, N. Y., July 30.

**George Alexander Kirker, M.D.,** Detroit; Starling Medical College, Columbus, Ohio, 1878; formerly a Fellow of the American Medical Association; a member of the Michigan State Medical Society, and once president of the Wayne County Medical Society; died at his home, July 14.

**Blake Edwin Ray, M.D.,** Cuba, Ill.; College of Physicians and Surgeons, Chicago, 1913, aged 26; a member of the Illinois State Medical Society, and secretary-treasurer of the Fulton County Medical Society; died at the home of his parents in Cuba, July 25, from acute nephritis.

**Marcus Boynton Austin, M.D.,** Brunswick, Mo.; Marion-Sims College of Medicine, St. Louis, 1897; aged 47; local surgeon of the Wabash Railway; a member of the National Association of Railway Surgeons; died in the railway hospital, Moberly, Mo., July 22, from septicemia.

**Charles Richard Palmer, M.D.,** Tuscumbia, Ala.; Vanderbilt University, Nashville, Tenn., 1883; aged 58; formerly a Fellow of the American Medical Association; a member of the Medical Association of the State of Alabama; died at his home, about July 27.

**Bertha S. Park, M.D.,** Denver; Denver College of Physicians and Surgeons, 1909; aged 39; died in a hotel in Chicago, August 6, from the effects of chloroform, self-administered, it is believed, with suicidal intent, while suffering from melancholia due to ill health.

**Philander W. Payne, M.D.,** Franklin, Ind.; Jefferson Medical College, 1858; aged 86; for several years trustee of Franklin College, and of the Indiana College of Physicians and Surgeons, Indianapolis; died at the home of his daughter in Indianapolis, July 30.

**Kenneth Evernghim Kellogg, M.D.,** New Britain, Conn.; College of Physicians and Surgeons in the City of New York, 1878; aged 43; a Fellow of the American Medical Association; died in the Hartford (Conn.) Hospital, June 10, from meningitis.

**Lieut. Floyd Smith Bates,** M. C., N. G. Mo., assigned Second Infantry; Adrian, Mo.; University Medical College of Kansas City, Mo., 1910; aged 30; while in camp at Fort Riley, Kan., August 7, was struck by lightning and instantly killed.

**Thomas A. Carey, M.D.,** Pen Argyl, Pa.; Jefferson Medical College, 1884; aged 71; formerly a member of the Medical Society of the State of Pennsylvania; also a druggist; died in the Jefferson Hospital, Philadelphia, July 25.

**Rollin Alexander Kirkpatrick, M.D.,** Troy, N. Y.; Albany (N. Y.) Medical College, 1898; aged 58; a Fellow of the American Medical Association; died in the Samaritan Hospital, Troy, July 28, from cerebral hemorrhage.

**Vernon M. Reynolds, M.D.,** Bristow, Okla.; College of Physicians and Surgeons, Keokuk, Ia., 1885; aged 60; health officer of Creek County, Okla.; died at his home, April 22, from heart disease following exposure.

**George Eugene Bliss,** Owosso, Mich. (license, Michigan, years of practice, 1900); aged 71; a practitioner for forty-four years; a veteran of the Civil War; died at his home, July 23, from cerebral hemorrhage.

**John Tate Haden, M.D.,** Crawfordsville, Ark.; Vanderbilt University, Nashville, Tenn., 1876; aged 64; for forty-three years a practitioner of Arkansas; died at his home, July 2, from cerebral hemorrhage.

**Ernest E. Best, M.D.,** Cameron, Tex.; Grand Rapids (Mich.) Medical College, 1903; aged 39; a member of the State Medical Association of Texas; died at his home, June 18, from tuberculosis.

**James E. Lay, Jr., M.D.,** Sweet Home, Tex.; Tulane University, New Orleans, 1901; aged 38; formerly a Fellow of the American Medical Association; died at his home, April 25, from heart disease.

**Ralph Frederick Koons, M.D.,** El Reno, Okla.; University of Michigin, Ann Arbor, 1901; aged 41; a Fellow of the American Medical Association; died at his home, July 1, from uremia.

**Alwine Kattenbracker,** Davenport, Ia. (license, Iowa, years of practice, 1887); aged 77; until a year ago a practitioner of Le Claire, Ia.; died at her home, July 31, from heart disease.

**Leonidas W. Tandy, M.D.,** Creighton, Mo.; Eclectic Medical Institute, Cincinnati, 1885; aged 67; a member of the Missouri State Medical Association; died at his home, June 5.

**George W. Holding, M.D.,** Breakabean, N. Y.; Albany, (N. Y.) Medical College, 1884; aged 60; for twenty years a practitioner of Watervliet, N. Y.; died in Troy, N. Y., July 25.

**Robert Andrew Kerr, M.D.,** Peoria, Ill.; Rush Medical College, 1881; aged 60; formerly a member of the Illinois State Medical Society; died in Petoskey, Mich., August 3.

**McMillan Jones, M.D.,** Acme, Wyo.; University of the South, Sewanee, Tenn., 1905; died at the home of his parents in Paris, Ill., July 27, from malignant disease.

**Anton Angelsberg,** Marshalltown, Ia. (license, Iowa, years of practice, 1887); aged 62; a practitioner since 1877; died at his home, July 27, from heart disease.

**Napoleon B. Davis,** Sullivan, Ind. (license, Indiana, 1897); aged 70; for forty years a practitioner; died at the home of his son in Farnsworth, Ind., July 30.

**John Coleman Kilgour, M.D.,** Harrison, Ohio; Pulte Medical College, Cincinnati, 1877; aged 71; a Confederate veteran; died at his home, July 23.

**Alonzo Givens, M.D.,** Mandeville, La.; Tulane University, New Orleans, 1857; aged 82; a Confederate veteran; died at his home, about July 22.

**Josiah Gates, M.D.,** La Plata, Mo.; Eclectic Medical Institute, Cincinnati, 1859; aged 85; died in the St. Joseph (Mo.) Hospital, July 24.

**Thomas Pettway Davis, M.D.,** Alexandria, Tenn.; Vanderbilt University, Nashville, Tenn., 1879; aged 59; died at his home, July 18.

**James Cowper Hannan, M.D.,** New York City; New York University, New York City, 1873; aged 71; died at his home, August 2.

**Thornton Daggy, M.D.,** Indianapolis; Eclectic Medical College of Indiana, Indianapolis, 1908; aged 37; died at his home, July 29.

**Capt. Lewis Emerson Clark,** Canadian A. M. C., Vancouver, B. C.; McGill University, Montreal, 1913; aged 29; was killed in action in France, in June.

**Mary Herrick Baynum, M.D.,** Dexter, Me.; Boston University, 1885; died at the home of her niece in Dexter, July 14, from cerebral hemorrhage.

**Charles A. De Cou, M.D.,** Pontiac, Mich.; Michigan College of Medicine, Detroit, 1884; aged 55; died at his home, about July 17.

**Frederick C. Strong, M.D.,** Denver; Denver Homeopathic College, 1898; aged 60; died at his home, April 27, from nephritis.

# The Propaganda for Reform

In This Department Appear Reports of the Council on Pharmacy and Chemistry and of the Association Laboratory, Together with Other Matter Tending to Aid Intelligent Prescribing and to Oppose Medical Fraud on the Public and on the Profession

## SOME MISCELLANEOUS NOSTRUMS*

**Limestone Phosphate.**—As the nostrum "Orangeine" is not even remotely related to the orange, so "Limestone Phosphate" is devoid of "limestone." No one would learn this fact, however, without purchasing the preparation, for the newspaper advertisements give no hint of the misleading character of the name of this nostrum. Probably with the idea of forestalling any action on the part of the federal authorities on the ground that it was misbranded, the trade package admits: "This product is not derived from limestone." Many of the newspaper advertisements of Limestone Phosphate are prepared in such a way as to simulate reading matter. There is nothing in the heading to show that the article that follows is a "patent medicine" advertisement, and even the telltale *"Adv."* at the end of the advertisement, which a government ruling demands, is not always found. Limestone Phosphate in the advertisements is not capitalized, but is so printed as to give the reader the impression that it is an official pharmaceutical product. Most of the headlines of the advertisements urge the drinking of hot water or "phosphated hot water." "Says Hot Water Washes Poisons from the Liver," "Says We Become Cranks on Hot Water Drinking," "Hot Water For Sick Headaches," "Drink Hot Water and Rid Joints of Rheumatic Rust"—these are some of the headlines of the "reading matter" advertisements urging the use of Limestone Phosphate. The nostrum has been analyzed by several chemists. The results of these analyses agree essentially in giving the composition of Limestone Phosphate as a mixture of baking soda and sodium acid phosphate. As soon as this mixture is put in water it effervesces, due to the reaction between the acid sodium phosphate and the alkaline baking soda, giving off carbonic acid gas and leaving behind what is virtually a solution of sodium phosphate in water. Those who are averse to paying a fancy price for a misleading name can purchase their sodium phosphate at any drug store under its own name. The average price for sodium phosphate which, as an official product, can always be counted on as being pure and of standard strength is about twenty-five cents a pound; Limestone Phosphate sells at the rate of $1.40 a pound.

**Parmint.**—This preparation emanates from the same city as the Sargol fraud, Binghamton, N. Y., and is exploited by individuals who do business under the somewhat imposing trade-name, "International Laboratories, Inc." "Catarrhal deafness, head noises, catarrh of the stomach, catarrh of the bowels, loss of smell, lung trouble, asthma, bronchitis" and various other conditions should, according to the Parmint advertising, be treated with this nostrum. The preparation comes in one ounce bottles for which 75 cents is charged. The purchaser is told to empty the ounce of Parmint into a half pint bottle which should then be filled with sugar syrup. The state chemists of Connecticut analyzed Parmint, and in the report of the Connecticut Agricultural Experiment Station for 1916 it is declared that "Parmint appears to be an alcoholic solution containing sugar, glycerin, a small amount of chloroform and a mixture of volatile oils with oil of anise predominating."

**Varnesis.**—This stuff used to contain 18 per cent. alcohol and, according to the state chemists of Connecticut, "less than 1 per cent. vegetable extractives chiefly derived from emodin-yielding (laxative) drugs and capsicum (cayenne pepper)." The preparation as now put on the market contains 15 per cent. alcohol. The manufacturers used to claim in the trade package (and the claims in all trade packages of "patent medicines" are subject to the federal Food and Drugs Act) that the preparation was a "Great Stomach and Rheumatic Remedy." These claims have now disappeared. The claim used to be made that "Varnesis has cured and is today curing hundreds"; this claim has also disappeared. It used to be "the most perfect combination of roots and herbs ever put together"; but it is so no longer. It used to be said: "Varnesis corrects all disorders of the stomach and restores vigor to all the organs of the body . . . Varnesis stimulates, purifies and enriches the blood, soothes the nerves and gives the vigor of youth . . . Varnesis restores sleep." All of these claims have been abandoned. "Varnesis" is sold as a cure for rheumatism, and the directions state that it should be taken six times a day, two tablespoonfuls to the dose. As "Varnesis" contains 15 per cent. alcohol, this means that the person taking it according to these directions is getting as much alcohol as he would obtain from the consumption of a half-pint of raw whisky every four and one-half days; or, to put it another way, it is the alcohol equivalent of about twelve bottles of beer a week.

**Fruitatives.**—According to a booklet sent out by the concern that exploits it, "Fruitatives" consists of

| | |
|---|---|
| "Fruit Liver Extract | 7/8 of a grain |
| "Special Extract of Nux Vomica Fruit | 1/20 of a grain |
| "Howard's Hydrochlorate of Quinine | 1/8 of a grain |
| "Extract of Quassa | Q.S." |

This alleged formula is, of course, a joke and would be so regarded by any druggist or physician. "Fruit Liver Extract" is the mysterious element that all falsely and misleadingly advertised "patent medicines" require for the purpose of successfully humbugging the public. "Special Extract of Nux Vomica Fruit" is probably nothing more mysterious than Extract of Nux Vomica, a drug long used in medicine and the one from which the deadly poisons strychnin and brucin are obtained. The medical properties of nux vomica are those of strychnin and brucin. "Hydrochlorate of Quinine" is one of the numerous salts of quinin and has the well-known action of quinin. "Extract of Quassa" is probably a misprint for Extract of Quassia, a simple "bitter." The methods by which "Fruitatives" are exploited are typical of the quack-medicine school. Advertisements claiming by inference that "Fruitatives" will cure "paralysis," "consumption," "rheumatism," etc., have appeared in various American and Canadian newspapers. It is probable that "Fruitatives" possess no virtues that are not to be found in the common aloin, belladonna and strychnin laxative pill.

* This material, with much additional, appears in the new edition of the pamphlet "Miscellaneous Nostrums," price 15 cents.

# Correspondence

## THE ROLL OF HONOR

*To the Editor:*—I note with a great deal of satisfaction your reference to "No Need for Drafting the Medical Profession" as referred to in your editorial (The Journal, Aug. 11, 1917). Doubtless there are very few laymen today who realize or appreciate to any degree the sacrifices which many members in our profession are making.

I know of one instance where a physician gave up a practice of $100,000 per year to accept the pay of a major. This man is now working in France. I know another connected with one of the large resorts in this country in which he receives thousands of dollars a year, yet who is willing to sacrifice that and accept the commission of a captain that he may serve his country and give aid to the boys on the firing line.

While there are thousands of cases similar to these, there are many slackers who are standing back and waiting for the other fellow to go, that this slacker may profit by the absence of the hero. I am indeed glad to note that you propose to publish an honor roll. I think it is unfortunate that you cannot also publish a dishonor roll, showing up at least to the medical profession those who, for pecuniary benefit,

are willing to sacrifice their patriotism to their country and their loyalty to the medical profession.

I believe it would be an excellent idea if the Surgeon-General would order every physician in the country who has accepted a commission in the Medical Reserve Corps to don his uniform, whether he is on duty or not, and in this way give an outward expression to the world that he is willing to undergo any sacrifice to serve his country and to be a striking example to the slacker. I believe this would do more to stimulate interest among the physicians, especially the younger men, than anything else.

One has only to look over the list of the great men of this country who have sacrificed practice, family ties, and self-interest, and gone to the front, to know who are the great physicians of this country.

I wish to take this opportunity to express to you my appreciation of THE JOURNAL, and of the way in which you have kept the medical profession, and especially those who have gone in the service, thoroughly informed regarding the movements of the profession in the war. You surely have been doing your bit.

CAPT. H. H. ROBERTS, M. R. C., South Poland, Me.

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*To the Editor:*—In Saturday's edition of THE JOURNAL (Aug. 11, 1917, p. 476) I find a paragraph concerning the "Roll of Honor" which you are to publish in the near future.

I wish to state that I sent in my application for commission in the Medical Reserve Corps sometime in June, and being an officer in Base Hospital Unit No. 11, I understand that these commissions will not be issued until sometime in the fall so as not to disrupt the organization of the Base Hospital Unit No. 11 by ordering the various officers to different camps. My name as well as those of the other officers who have sent in their commission will not be placed in this "Roll of Honor" for the reason that we have not had a chance to return the acceptance of the commission.

Would it not be advisable therefore if you would add the personnel of the various base hospitals throughout the United States on this "Roll of Honor"? Of course, this is only a suggestion, as there is certainly no doubt in my mind that membership in the base hospitals necessarily obliges the holders to accept service at any time.

HENRY SCHMITZ, M.D., Chicago.

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*To the Editor:*—In THE JOURNAL last week you promise to publish the "Roll of Honor," the names of those physicians who have accepted commissions in the Medical Reserve Corps. There is also a list which should be put in a subroll at least, and that is the 2,000 physicians who volunteered for the service and were rejected for physical defects. All honor to those who have volunteered and have been accepted but no stigma should attach to those who made an honest effort but were not physically qualified.

F. W. STARR, M.D., Stanley, Wis.

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### EXEMPTION OF MEDICAL STUDENTS

*To the Editor:*—I was so much impressed by the figures that you published in THE JOURNAL last week, showing the large percentage of medical men of military age who have been called for military service, that this morning, at a meeting of the New York City District Board, I brought the matter to the notice of Judge Charles E. Hughes, who is serving as our chairman. Judge Hughes pointed at once to General Crowder's instructions to district boards, to the effect that medical students could not be exempted under the law, and that district boards had no power to grant such exemptions. At first Judge Hughes suggested that an effort be made to obtain from the President, through the Secretary of War, an appropriate supplement to the regulations which govern the work of the district boards. Later in the day, after a careful rereading of the statute itself, Judge Hughes advised me that the President had no power to act in the matter and that no relief could be obtained otherwise than through an act of Congress. I thereon dispatched the following telegram to Major Franklin Martin:

> "Charles E. Hughes, Chairman New York District Board, advises that we cannot exempt medical students from draft. Fifty per cent. of medical students in first and second draft groups threatens welfare of country. Judge Hughes advises only remedy is through act of Congress. Will you take action? Would like something done before joint meeting of all New York State District Boards on Thursday sixteenth."

It seems to me that the welfare of the country is bound up in this matter to a very large degree, and it would be a pity if the danger were not averted merely because the medical profession as a body failed to act. You are perhaps in a better position than any one else to facilitate concerted action in an emergency of this sort, and it is for this reason that I am writing to you on the subject.

S. S. GOLDWATER, M.D., New York.

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## *Queries and Minor Notes*

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

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### THE STATUS OF MEDICINE AND SURGERY

*To the Editor:*—I have been requested to prepare an article on the subject of "The State of Medicine and Surgery in the United States Today." Will you please inform me where I can get the necessary data? In regard to medical education, I can find it in my files of THE JOURNAL.

GEORGE H. JUILLY, M.D., San Francisco.

ANSWER.—The following is a list of references to articles on this subject:

Nichols, J. B.: American Achievement in Medicine, *Washington Med. Ann.*, May, 1917.
Craig, F. A.: Progress of Medicine During the Year 1913, *Internat. Clin.*, **1**, 193.
Jackson, T. T.: The Advance of Good Surgery, *Texas State Jour. Med.*, March, 1917.
Crile: Contemporary American Surgery, *Brit. Jour. Surg.*, July, 1916.
Cowden, C. N.: The Trend of the Times in Medicine and Surgery, *Jour. Tennessee Med. Assn.*, April, 1917.
Parallel Between American and French Surgery, Paris Letter, THE JOURNAL, March 14, 1914, p. 821.
Crile, G. W.: Contemporary American Surgery, *Brit. Jour. Surg.*, April, 1915.
Boyd, F. D.: Development of American Medicine, *Texas State Jour. Med.*, June, 1915.
Literature on Recent Medical Discoveries, Queries and Minor Notes, THE JOURNAL, Jan. 17, 1914, p. 224.
Mock, Harry E.: Industrial Medicine and Surgery: The New Specialty, THE JOURNAL, Jan. 6, 1917, p. 1.
Van Sweringen, G.: Medicine, *Indiana State Med. Assn. Jour.*, January, 1915. (This number contains papers by various men on advances in each branch of medicine and surgery.)

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### NO ACTION ON LAW REGARDING OSTEOPATHS IN ARMY

*To the Editor:*—I should like to know if Congress has recently or ever made a ruling which gives osteopaths the privilege of entering the Medical Corps of the Army or Navy in the same rank as a physician of the regular school. I have seen in the papers recently that this law was passed in Congress, and I wish to know whether the item was authentic.

W. H. MINER, M.D., Farmer City, Ill.

ANSWER.—An amendment to the effect that one osteopath should be assigned to each thousand troops in the United States Army, the osteopath to be given the rank of first lieutenant in the Medical Corps, was recently introduced in Congress. No action has been taken on this amendment.

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### HIGH CALORY DIET IN TYPHOID FEVER

*To the Editor:*—Please give me a working outline of the high calory diet in typhoid fever referred to by Dr. Warren Coleman, New York, in his article in THE JOURNAL, Aug. 4, 1917.

A. L. GLAZE, JR., M.D., Athens, Ala.

ANSWER.—Coleman has suggested various combinations of milk, cream and lactose to be given in the earlier stages of the disease. Eggs may be added to make up the protein requirement. Some of the cream may be given in the form of ice cream. In certain cases if patients have no difficulty with

mastication, custards, mashed potato, cocoa, apple sauce and cereals are given, although these articles are usually more suitable later in the course of the disease. It is difficult to give more than 3,000 calories a day in the early part of the disease. When the temperature is falling and in convalescence, from 4,000 to 6,000 calories may be given.

Examples of some of the milk, cream and lactose mixtures are as follows:

| | Calories |
|---|---|
| **For 1,000 calories a day:** | |
| Milk, 1 quart (1,000 c.c) | 700 |
| Cream, 1⅔ ounces (50 c.c.) | 100 |
| Lactose, 1⅔ ounces (50 gm.) | 200 |
| **This furnishes eight feedings, each containing:** | |
| Milk, 4 ounces | 80 |
| Cream, 2 drams | 15 |
| Lactose, 6 drams | 24 |
| **For 2,000 calories a day:** | |
| Milk, 1½ quarts | 1,000 |
| Cream, 8 ounces (240 c.c.) | 500 |
| Lactose, 4 ounces (125 gm.) | 500 |
| **This furnishes seven feedings, each containing:** | |
| Milk, 7 ounces | 150 |
| Cream, 1 ounce | 60 |
| Lactose, 18 gm. | 72 |
| **For 3,000 calories a day:** | |
| Milk, 1½ quarts | 1,000 |
| Cream, 1 pint (480 c.c.) | 1,000 |
| Lactose, 8 ounces | 1,000 |
| **This furnishes eight feedings, each containing:** | |
| Milk, 6 ounces | 120 |
| Cream, 2 ounces | 120 |
| Lactose, 1 ounce (30 gm.) | 120 |

The following is a sample diet for a day in which 3,910 calories are to be given:

| | Hours | Total | Calories |
|---|---|---|---|
| Milk, 6 ounces | 9 a. m.; 1, 3, 7 p. m. | 1,260 c.c. | 860 |
| Cream, 2 ounces | 10 p. m.; 1, 4 a. m. | 420 c.c. | 840 |
| Lactose, 10 gm. | | 70 gm. | 280 |
| | | | 1,980 |

| At 11 a. m.: | Calories |
|---|---|
| Egg, 1 | 80 |
| Mashed potato, 20 gm. | 20 |
| Custard, 4 ounces | 250 |
| Toast (or bread), 1 slice | 80 |
| Butter, 20 gm. | 150 |
| Coffee | .. |
| Cream, 2 ounces | 120 |
| Lactose, 20 gm. | 80 |
| | 780 |

| At 5 p. m.: | Calories |
|---|---|
| Egg, 1 | 80 |
| Cereal, 3 tablespoonfuls | 150 |
| Cream, 2 ounces | 120 |
| Apple Sauce, 1 ounce | 30 |
| Tea | ... |
| Cream, 3 ounces | 180 |
| Lactose, 20 gm. | 80 |
| | 640 |

| At 7 a. m.: | Calories |
|---|---|
| Egg, 1 | 80 |
| Toast, 1 slice | 80 |
| Butter, 20 gm. | 150 |
| Coffee | ... |
| Cream, 2 ounces | 120 |
| Lactose, 20 gm. | 80 |
| | 510 |

Lactose lemonade may be substituted for the milk mixture at 3 o'clock.

The article from which the foregoing diet was taken appears in Musser and Kelly, Practical Treatment, Volume IV.

## Medical Education and State Boards of Registration

### COMING EXAMINATIONS

ALASKA: Juneau, Sept. 4. Sec., Dr. S. P. Dawes, Juneau.

ARIZONA: Phoenix, Oct. 2-3. Sec., Dr. John Wix Thomas, 306 Goodrich Bldg., Phoenix.

COLORADO: Denver, Oct. 2. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

HAWAII: Honolulu, Sept. 10-13. Chairman, Dr. Grover A. Batten, 1141 Alakea St., Honolulu.

IDAHO: Pocatello, Oct. 2. Sec., Dr. Charles A. Dettman, Burke.

MASSACHUSETTS: Boston, Sept. 11-13. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

MINNESOTA: Minneapolis, Oct. 2-5. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.

MONTANA: Helena, Oct. 2. Sec., Dr. William C. Riddell, Power Bldg., Helena.

NEW YORK: Albany, Buffalo, New York City and Syracuse, Oct. 2-5. Chief, Examinations Division, Harlan S. Horner, State Education Bldg., Albany.

PORTO RICO: San Juan, Oct. 2. Sec., Dr. M. Quevedo Baez, San Juan.

RHODE ISLAND: Providence, Oct. 4-5. Sec., Dr. Byron O. Richards, State House, Providence.

UTAH: Salt Lake City, Oct. 1-2. Sec., Dr. G. F. Harding, Templeton Bldg., Salt Lake City.

## Social Medicine, Medical Economics and Miscellany

### OBSERVATIONS ON THE PHYSICAL EFFECTS OF FLYING

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FORT SNELLING, MINN.

The year and a half during which I was constantly associated with the flying at the aerodrome at North Island, San Diego, Calif., gave me ample opportunity to observe the physical status of the flyers. Two things must be discounted in considering this matter: first, the equable climate of San Diego, and secondly, the excellent physical and nervous stamina of the men participating. Regarding the former, San Diego presents practically the same climate as southern Italy; in consequence, the diseases which are of daily occurrence in more rigorous climates are rarely seen there.

The men are chosen from the Army at large, practically every corps being represented with the exception of the medical corps. The applicants are subjected to a most strenuous physical examination, in which not only the general physical and nervous system is considered but also the temperament of the man. Men showing marked nervous tendencies are frequently turned down. Special attention is given to the vision and to the organs of equilibrium; any defect in the latter would obviously unfit a man for service in which any position at any angle is of constant occurrence.

It may readily be seen, therefore, that men subjected to so careful a selective process, and living in such an equable climate, would have fewer physical ailments than have flyers in general. From my observations, I came to the conclusion that the effects of flying on the individual were manifest chiefly on the nervous system and on the general health indirectly, through the nervous system.

One of the main barometrics of fluctuation in the status of a healthy individual's nervous tone is the blood pressure.

Fear, unusual nervous tension, or, in fact, any definite variation of the emotions, will cause fluctuations in blood pressure.

#### BLOOD PRESSURE EXPERIMENTS

The blood pressure experiments were carried out as follows: Certain men, twenty in all, were selected, and their blood pressures taken daily, immediately before and after each flight. The experiments were carried out over a period of six weeks. It was not found feasible to make observations in the air on account of the noise and vibrations of the machines. As a result of these experiments it was found that the mean general average of blood pressure compared very favorably with the normal of that age. It was the comparative readings before and after flight which were of interest. These readings were shown to be definitely higher in nearly every case immediately before flying than on returning to the ground. The few exceptions to this rule were in men showing marked nervous fatigue or to whom some disagreeable incident had occurred in the air. In these men the blood pressure was higher on their return to the ground and remained so for several hours afterward. The fluctuations of the diastolic pressure were synchronous with those of the systolic, but to a lesser degree, showing an average of three points less.

These findings are attributed to the fact that the moderate excitement attending the anticipation of flight, combined with the naturally increased mental and nervous activity, caused the rise in blood pressure. On the finishing of the flight the immediate nervous relaxation is shown by the drop in pressure. The differences in the readings occurring before and after flight were more marked in the newer flyers when first placed under instruction, showing their increased nervous tension at that time. The older and more experienced flyers showed scarcely any variations in pressure readings before and after flight, and their general average was lower

than the newer men. The records showed no fluctuation of sufficient degree to be suggestive of anything pathologic, merely accentuating the fact of the increased nervous strain to which the aviator is at all times subjected, and showing the gradual adaptation of the individual to this strain.

Occasionally men complained of feeling stale, tired, and not up to the mark. This was ordinarily due to late hours, need of a vacation, or lack of stamina, on the part of the individual. Irritability on the part of some of the instructors was quite marked at times; their work is unquestionably very trying, and their number of hours in the air greater than the others.

### EFFECT OF ALTITUDE FLIGHTS

Regarding altitudes and the physical effect on the flyers, it might be noted here that the mean atmospheric pressure at sea level will balance a column of mercury 30 inches high, and that in ascending there is a direct fall in pressure of 1 inch of mercury to every thousand feet ascended. The relative proportion of the constituent gases of the atmosphere remains the same with the exception of the watery vapors, which are confined to the lower levels. As the aviator ascends, the tension of the gases in the bodily fluids balances that of the surrounding air. Obviously the quantity of oxygen per cubic foot of air becomes progressively less as the pressure decreases; further, there is a drop in the arterial blood pressure of the flyer.

The latter factor is slight in a healthy adult, and of minimum importance up to 6,500 feet; above this altitude the blood pressure drops more rapidly. In older men with some hardening of the arteries, there is a much more decided drop in pressure, which change is evidenced by slight headache, vertigo, and tinnitus aurium. This fact may be noticed any day in crossing the mountains in a railway train. If the portly, florid man is questioned, he will acknowledge these symptoms, which are largely due to lack of elasticity of the blood vessels and consequent inability on their part to contract and establish rapid equilibrium between the arterial pressure and the lowered atmospheric pressure.

As has been previously stated, the watery vapors are confined to the lower strata, and as these are instrumental in retaining the heat of the sun's rays, the atmosphere becomes cooler as one ascends. It will thus be seen that in making altitude flights, three main factors must be considered; first, there is less oxygen to breathe; second, the arterial blood pressure is less, and last there is a decided drop in temperature. Some interesting and valuable data have been gathered at various times both in this country and abroad in regard to the effects of altitudes on the individual; these experiments have been carried out on the peaks of high mountains. It has in the first place been shown that among mountain climbers much more energy is expended by the untrained than by the trained climber; further, that men living in high altitudes develop a higher percentage of erythrocytes and hemoglobin. This variation has been shown to be approximately 5 million red cells per cubic millimeter, at sea level, to 8 million at 14,000 feet. The hemoglobin is increased from 20 to 30 per cent.

### SCARCITY OF OXYGEN MAY CAUSE SICKNESS

The reason for this can be readily seen; the amount of oxygen per cubic foot of air is much less at high altitudes; the bodily oxygen demand remains constant; therefore, any sudden muscular activity would bring the margin of oxygen safety down to the danger zone. In consequence, nature compensates by giving the blood more oxygen-carrying and storing elements so that in case of any excessive exertion the body would have an adequate supply of this necessary gas. Altitudes have a tendency to increase the chest capacity, in this way increasing the oxygen intake. Mountain sickness, a malady which is directly attributable to the scarcity of oxygen at the higher levels, occurs in Europe as low as 9,800 feet, in the United States as a rule at considerably higher points. The symptoms of this disease are a heavy oppressed feeling in the chest, with dyspnea and cyanosis. There are also varying degrees of mental depression, accompanied by nausea and vomiting. These symptoms are unquestionably accentuated and brought on at a lower level by the mountain climber, owing to the excessive physical effort in making the ascent. Sitting quietly in the aeroplane, we should not expect such severe symptoms, nor should we expect any difficulty at all at such low altitudes.

Some men complain of slight vertigo and headache when flying at altitudes of between 12,000 and 16,000 feet; these symptoms are dispelled by deep inhalation. Some men who have flown at high altitudes constantly over a long period of time have developed a definite susceptibility to the effects of altitudes. One of the most pronounced cases of this kind is that of Lieutenant Cowdin, an American in the French Army. Mr. Cowdin has won the Croix de Guerre, the Medaille Militaire, the cross of the Legion of Honor, and the War Cross. He has brought down some seventeen of the machines of the enemy, but at the present time is unable to fly at an altitude of over 3,000 feet without experiencing most annoying palpitation of the heart and dyspnea. The more severe symptoms of altitude sickness are immediately relieved by the inhalation of a few whiffs of oxygen or the administration of some cardiac stimulant. The direct causative factor of this condition seems to be a definite weakening of the myocardium, owing to an inadequate supply of oxygen; this being supplied, the heart immediately resumes its normal functioning. This all tends to emphasize the value of training and the need of excellent physical form for the aviator. It is suggested that men who are going out after altitude records should live in the higher mountain regions for a time so that the body will be in the best possible condition to meet the demands of the occasion. This not being practicable, a small oxygen tank with an inhaler may be taken along. This procedure corresponds to the necessary carburetor adjustment with which the aeroplane is provided on these occasions.

### PHYSIOLOGIC EFFECT OF ACCIDENTS

Two distinct phenomena stand out vividly in my mind in connection with men who have been subjected to a fall of any severity. These are, first, the immediate effects, and secondly, the more remote after-effects. I have seen men pulled out of wrecked machines after a fifty-foot fall or a bad side slip, suffering from extreme shock, as evidenced by a weak pulse, subnormal temperature and pallor, with either an active delirium or a stupor. These men may recover and come back and fly as well as ever. Other men, who were only moderately shocked at the time of the accident, later developed vague nervous symptoms which persisted for months, incapacitating them for work of any kind. Some of these men are forever afterward machine shy. One aviator had a slight mishap; on landing, the machine was turned over, but no one was hurt. For a long time afterward, this man consistently overcontrolled and spoiled all his landings.

### HYPNOTIC EFFECT AS A CAUSE OF ACCIDENTS

Another rather interesting condition, of less frequent occurrence, is that in which the flyer apparently experiences a lapse or a period during which he remembers nothing and is unconscious of everything which has occurred. A few men have acknowledged to me that they have had such an experience. The most glaring of these lapses occurred to Mr. Herbert Latham, who at the time was flying an Antonette monoplane on Dominicus field in 1911. Latham came down on top of the grand stand and smashed his machine. He explained the affair by stating that at his last recollection of anything he was flying level at an altitude of some 500 feet; the next thing he knew he was on top of the grandstand. The general consensus seems to be that the monotonous drum of the propeller, combined with the entire removal from external stimulus, has a hypnotic effect and that this effect is much increased if the aviator looks steadily at the propeller. In other words, he should keep interested in the passing show. Many accidents in which the aviator has lost his life, and which are of such a nature as to be entirely inexplicable, may be attributed to this cause. One of the main attributes of the stabilizer with its automatic control, as demonstrated by Mr. Macey in his recent invention, will undoubtedly tend

to prevent accidents of this nature. It has been repeatedly demonstrated that a land machine will float, for a time at least, if unfortunate enough to land in the water. The sad death in 1914, of Lieutenent Gerstner, who endeavored to swim ashore after his machine had gone into the ocean, suggests the advisability of staying with the plane. His companion was saved after being kept afloat for several hours by holding on to the buoyant wings.

I have known many flyers both among the civilian and the military aviators, and have tried to pick a type, a man whose entire physical and mental make-up should enable him to perfect himself in the art of flying. My conclusions are that the type does not exist. I believe that the early training of athletics is invaluable as a preliminary for flying. Athletics give a man instant perception, quick judgment, with a rapid and facile coordination of the physical, all of which are essential assets in the flying game.

Many of these intrepid pioneers of the air have lost their lives in this most hazardous but most fascinating of all sports. These losses should not be in vain; the cause of each fatality should be carefully determined, so that the mistakes will not be repeated. The American is a composite and should lead in aviation; in him is combined the daring of the French with the ultraconservatism of the English and German, and there are certainly times when both of these factors are needed.

### Gas-Heated Appliances and the Air of Workshops

Charles Weisman, sanitary chemist in the United States Public Health Service, has recently described (*Pub. Health Bull.* 31) the effect of gas-heated appliances on the air of workshops. The work was done in connection with the general investigation of the health of garment workers in New York City.

An analysis of air samples in shops of the garment industry was made with reference to the amount of carbon monoxid gas present. Studies were also made of the conditions of gas-heated appliances. Laboratory examinations were made of gaseous combustion products of various kinds of gas-heated pressing irons. Tests were made of the permeability of the walls of various kinds of flexible gas tubing, of the security against leakage of gas connections, and of the hygienic significance of the presence of small amounts of carbon monoxid in the air of confined, inhabited places. Air samples were taken from 244 shops. Of these, twenty-nine, or 11.8 per cent., were found to contain over 100 parts of carbon monoxid per million parts of air, the average for the twenty-nine samples being 325 parts, ranging from 105 to 1,431 parts. In fifty-five shops the carbon monoxid ranged from twenty-five to 100 parts per million, or an average of 47.3 parts. The investigation was conducted during the open window season. During the winter season, with the windows closed, the contamination would undoubtedly be worse. No mechanical system of ventilating was employed in any of the shops. Defective rubber tubing was found in fifty-two of the 244 shops, or 21.3 per cent. of the total. In thirty-six, defective tubing was found, and in the remainder of the fifty-two, in addition, there were found defective gas tubing connections, defective gas irons and defective flexible metal tubing, the last being found in sixteen shops, or 6.5 per cent. of the entire number of shops examined. One out of every four shops examined was using some kind of defective gas tubing, and 7 per cent. had poor gas tubing connections. In a number of reinspections, even higher percentages of carbon monoxid were found in some instances. Sixty-eight permeability tests were made on the walls of thirty pieces of gas tubing, comprising sixteen different varieties of tubing. None were found to be gas-tight; rubber tubing is least permeable to illuminating gas; flexible metal tubing and "composition" tubing give considerable leakages of this gas. Defective and poorly fitting rubber connections, as a rule, are greater sources of leakage than defective gas tubing.

The symptoms of chronic carbon monoxid poisoning, such as might be produced by the amounts of gas found in the investigation in the air of workshops, are headache, pallor, anemia, derangements of the digestive system, a slow pulse, mental dulness, fatigue after but little exertion, failing memory, palpitation of the heart, and a tendency toward difficu't breathing. Carbon monoxid has produced symptoms in different individuals in amounts of 0.3 per cent. for fifty minutes, 0.4 per cent. for forty minutes and twenty-five minutes, 0.25 per cent. for twenty minutes, 0.5 per cent. for 11½ minutes, etc. The injurious effect arises from the affinity of the hemoglobin of the blood for the carbon monoxid.

## Book Notices

Experimental Pharmacology. By Dennis E. Jackson, Ph.D., M.D., Associate Professor of Pharmacology, Washington University Medical School, St. Louis. Cloth. Price, $4. Pp. 536, with 390 illustrations. St. Louis: C. V. Mosby Company, 1917.

This laboratory manual fully sustains the author's reputation as an investigator and master of technic. The introduction shows not only a detailed knowledge of the actualities and difficulties in physiologic experimentation, but an ability to state prospective difficulties so vividly that the student can benefit to the greatest degree by the work of others. In the beginning of the laboratory work a concise and almost complete list of apparatus is given in such form that an instructor preparing for the work has little to do but order the list. The illustrations are exceptionally good, and profuse. However, one wonders why space and expense should be taken with cuts of beakers, graduates, battery jars, etc., although this is excusable in consideration of the many valuable illustrations not easily found in other works. In this book, as in most works dealing with surgical operations of any kind, the author's methods as illustrated need not be considered as the only methods, but as good methods. After a course in physiology in a good school, many of the details of the operative procedure should be superfluous; but for most students into whose hands this book comes, that time has not yet arrived. Jackson's manual is primarily prepared for the laboratory of pharmacology, but it may be used with profit also in physiology. The drug experiments are excellently presented. More amphibian experiments might be profitably included so that the usefulness of the book should not be limited in places in which mammals are less easily procurable than in the larger cities. There are many valuable suggestions in the concluding chapters on shop work and photography. The list appended of dealers in apparatus, tools, supplies, equipment, etc., is important in itself, and will save the time of many a laboratory worker.

Asthma: Presenting an Exposition of the Nonpassive Expiration Theory. By Orville Harry Brown, A.B., M.D., Ph.D. With a foreword by George Dock, Sc.D., M.D., Professor of Medicine, Washington University Medical School, St. Louis. Cloth. Price, $4. Pp. 330, with illustrations. St. Louis: C. V. Mosby Company, 1917.

This book represents nine years of study of asthma by the author, and is chiefly a support of his nonpassive expiration theory. In a foreword to the book, Dr. George Dock states that he has been much impressed by the accuracy of the author's clinical work and by the fulness and symmetry of the literary production. He says further, "The student and the practitioner can find in this book a true picture of the previous speculations and present knowledge of asthma expressed clearly and concisely. . . ."

Dr. Brown's introductory chapter is most interesting. He outlines his method of study, and follows with a short chapter on the definition of the disease. The third chapter, which is perhaps one of the most important in the book, concerns historical observations and theories. There are 470 references to original articles on this subject, and practically every known theory as to the causation of this condition is given, including many that are ridiculous on first thought, as well as others which have borne the test of time and demand more careful consideration. These data are analyzed under fifteen headings, and give in outline the present state of our knowledge of asthma. After the consideration of the anatomy

and physiology of the lungs and the pathology and physiology of dyspnea, the author states his theory. In brief, this is that asthmatic dyspnea is essentially a mechanical interference with the blood and lymph circulation in the lung due to heightened intra-alveolar tension which arises from nonpassive expiration. By nonpassive expiration is meant morbid attention to the act of respiration, such as results in coughing, sneezing, etc., which make expiration an active muscular effort instead of a passive one. Numerous physiologic and pathologic factors accompany such efforts, all of these aiding in the production of the asthmatic dyspnea. The author's theory is based on a close study of numerous attacks of the disease.

He then proceeds to coordinate with this theory of asthma other points of relative importance, such as the anaphylactic factors, reflexes, nasal conditions, coincident tuberculosis and emphysema, focal infection, etc. This occupies the first half of the book.

The remainder of the book is devoted to the pathology of asthma, clinical history, physical signs and symptoms, diagnosis, treatment and prophylaxis. In the discussion on treatment, the author describes all of the already known treatments, with particular reference to special treatment adopted toward overcoming the particular pathology which accompanies the nonpassive expiration. The treatment prescribed is rational and inclusive of all tested methods.

THE BABY'S FOOD. Recipes for the Preparation of Food for Infants and Children. By Isaac A. Abt, M.D., Professor of Diseases of Children in the Northwestern University Medical School. Cloth. Price, $1.25 net. Pp. 143. Philadelphia: W. B. Saunders Company, 1917.

This book is prepared by the author in order to furnish young mothers, nurses and caretakers with recipes for the preparation of commonly used babies' foods. The recipes are collected from numerous reliable sources. The book includes, in addition to a great number of recipes, a table of weights and measures, and lists of mineral constituents and of the caloric value of various foods. The concluding chapters are devoted to diet lists for children of various ages and special diet lists for diarrhea and constipation. Instructions are also given regarding various mechanical and hydrotherapeutic methods for babies. The book will be found of great practical value to those for whom it is intended.

CITY MILK SUPPLY. By Horatio Newton Parker. Cloth. Price, $5 net. Pp. 493, with 63 illustrations. New York: McGraw-Hill Book Company, Inc., 1917.

This book has chapters dealing with the general physical and chemical characters of milk, the diseases communicated by milk, sanitary milk production, dairy cattle and the dairy farm, transportation of milk, and the milk contractor. There is also an excellent section on control of the public milk supply. The style is clear and objective, and typographic errors are practically absent. The treatment of pasteurization and of the use of the score card is particularly full and discriminating. The discussion of methods of control of the public milk supply is conservative and in line with the best practice in this country. The illustrations are almost uniformly good, and the tabular matter, of which there is a great deal, is well presented. As a whole, the book will prove of great value to all practical public health workers.

THE AMERICAN ENCYCLOPEDIA AND DICTIONARY OF OPHTHALMOLOGY. Edited by Casey A. Wood, M.D., C.M., D.C.L., Professor of Ophthalmology and Head of the Department, College of Medicine, University of Illinois. Volume 10—Lenicet to Muscles, Ocular. Cloth. Price, $8. Chicago: Cleveland Press, 1917.

The important and outstanding topics in Volume 10 of this splendid work are lenses, military surgery of the eye, and a voluminous article on the ocular muscles which expounds in detail the theories of Savage on the eye muscles and the theoretical brain centers controlling their action. Among other subjects included are localization of foreign bodies, light, massage, ocular complications of measles, and mercury. In every respect the high quality of this great work on the eye is maintained in the present volume.

# *Medicolegal*

### Damages for Failure to Remove Gauze and Portion of Tube

*(Baer vs. Chowning (Minn.), 161 N. W. R. 144)*

The Supreme Court of Minnesota affirms an order denying a motion made by the defendant for judgment or a new trial, after a verdict for $2,500 had been rendered in favor of the plaintiff. The court says that the plaintiff's right to recover damages was limited to negligence in leaving a gauze pack or sponge and a portion of a rubber drainage tube in her body. There were no other claims of negligence. It was not claimed that the defendant was unskilful or negligent in the performance of the operation. The evidence was that, Aug. 14, 1914, the defendant performed an abdominal operation on the plaintiff. Two incisions were made, one in front and one in the side. The one in the side did not heal. A fistulous opening developed. July 14, 1915, another surgeon performed an operation. He found in the abdominal cavity, according to his testimony, a gauze pack or sponge which had been used in the operation and a portion of a rubber drainage tube. This testimony made the question of the defendant's negligence for the jury. With regard to the amount of the verdict: The plaintiff's suffering had been severe. She had been incapacitated from work. If her testimony and that of others was credited, she was still in bad health and in a nervous and enfeebled condition and far from well. There was no direct testimony that her suffering or her condition resulted from the leaving of the pack and the tube in the body. It was a matter of fair inference for the jury. As soon as they were removed, the wound healed and pains became less. Perhaps the verdict was large. This court cannot say that it was excessive.

### Bases for Expert Testimony

*(Chicago, R. I. & P. Ry. Co. vs. Jackson (Okla.), 162 Pac. R. 823)*

The Supreme Court of Oklahoma, in reversing a judgment rendered against the railway company for damages for personal injuries, says that it is well settled that the opinion of an expert witness is permissible when based on his personal knowledge of the matter under investigation, or on competent evidence in the case, or on both. But the authorities are not in harmony as to the proper limitations that should be placed on the testimony of consulting physicians, in giving expert testimony as to the nature or probable effect of an injury. The great weight of authority appears to support the rule that statements made to a physician by a patient, as to the cause and manner of the happening of an injury, which statements are not made so near in point of time to the fact as to constitute a part of the res gestae or essential circumstances of the case, are not admissible in evidence. In many of the cases the testimony of a physician as to statements made to him by a patient in relation to the history of his case — that is, as to his past or previous condition, symptoms, sensations and feelings — is held admissible, when sought to be introduced in connection with the physician's opinion as an expert, as furnishing a basis therefor, or for the reasons on which such opinion is founded. On the other hand, a line of authorities support the rule that the testimony of a physician as to statements made by him to a patient, concerning the history of his case, his past condition, symptoms, pain and suffering, is hearsay and inadmissible. Aside from the question of the statements in proper cases being admissible as a part of the res gestae, the correct rule, it would appear, should permit a physician to testify to a statement or narrative given him by his patient in relation to his condition, symptoms, sensations and feelings, both past and present, when made in connection with his own opinion as to the cause of the injury, though the statement may not be received as independent evidence to establish the fact of the injury. When made the basis, in part at least, of the physician's opinion, such testimony is admissible from necessity, because in this way only can the bodily condition of the party, who is the subject of the injury, be ascertained. The rule should not, however, be extended beyond the necessity on which it

is founded. In such circumstances, and, indeed, whenever declarations are admissible, it is for the jury to determine whether they express the real feelings of the party, or whether they are feigned; and for obvious reasons, whenever there appears a motive to manufacture testimony, the declarations should be subject to the closest scrutiny. On the other hand, facts not required for a satisfactory diagnosis, such as the cause of an injury, as to the instrument with which it was inflicted, or the like, constituting a narrative of the incidents of a past transaction, are incompetent. In other words, this court holds that a physician in giving evidence as an expert may testify to a statement made to him by the patient in relation to his condition, symptoms, sensations and feelings, both past and present, when such statements were received and were necessary to an examination, with a view to his treatment, and when made the basis, in part at least, of the physician's opinion; but such testimony cannot be considered as independent evidence of the facts stated, except in cases in which the same is competent as forming a part of the res gestae. Facts not required for a satisfactory diagnosis, such as the cause of an injury, the means or manner by which it was inflicted, or which attempt to fix the responsibility for its occurence, are regarded as a narrative of the incidents of a past transaction, and are accordingly rejected, unless made so near in point of time as to constitute a part of the res gestae. Expert testimony of a physician, based on a physical examination of the patient, after action instituted by him to recover damages for an alleged personal injury, though made partly for the purpose of enabling the physician to testify as a witness, is not, on that account alone, incompetent, though constituting a fact which may materially affect his credibility.

### Importance and Validity of Vital Statistics Law

*(State vs. Norvell et al. (Tenn.), 191 S. W. R. 536)*

The Supreme Court of Tennessee holds valid the vital statistics law of that state, Chapter 30 of the Acts of 1913. The court says there can be no question but that this statute will tend to promote the safety, health and well-being of the community. The state of Tennessee maintains a board of health at considerable expense, created for the purpose of fighting and endeavoring to control the diseases to which the inhabitants of the state are subject. Perhaps the most important duty of the state board of health is to take steps, in cooperation with local health officers, for the prevention of disease. This work cannot be intelligently or effectively prosecuted without the information which the statute in question is designed to afford. The various local registrars are required to file the certificates procured by the undertakers with the board of health. From these data the board of health can determine the needs of each particular community in the state, and may employ the necessary measures accordingly. These reports will show where tuberculosis prevails, where typhoid predominates, where there is malaria, and, generally speaking, will indicate the hygienic wants of each section of the state. The board of health will thus be able to take the precautions and administer the relief most needed by every community. Such a system is just as necessary to a successful campaign by the board of health as is information concerning the enemy's movements to the general in command of an army. There can be no specialized or well-directed effort by the board of health without such knowledge. Looking to another aspect of the material welfare of the state, no considerable immigration from one state to another now occurs until those coming in have made inquiries as to the health and death rate of the particular locality to which they intend to move. With the information forthcoming from the operation of the vital statistics law, the board of health will be in a position at all times to reply to such inquiries from those desiring to move into Tennessee. The provisions of the statute with reference to the registration of births, which were not drawn in question on this appeal, will obviously be most useful. A permanent record of the births and parentage of all persons born in the state will be of great service in the administration of estates and in fixing the devolution of property. Such matters are often questions of doubt in important litigation. The statute makes certified copies of these records prima facie evidence. The records of births likewise will prove of much value in the enforcement of the laws against child labor. They will make fraud and deception on the part of parents and employers impossible. The court might mention other beneficent offices of the statute, but sufficient has been said to demonstrate that the act is a wholesome exercise of the police power of the state. Such being the view of the act, it is obvious that the constitutional objections urged against it were not well made, wherefore the court reverses a judgment quashing an indictment of the defendants, who were undertakers who were charged with handling and removing a dead body without a permit for its removal, the motion to quash having been sustained on the ground that the vital statistics law was unconstitutional. It is conceivable, of course, that the attending physician or local registrar or others may prove obstreperous or unmindful of the obligations imposed by the statute; but, in such an event, the undertaker may safely proceed with the disposition of the body. If he is diligent himself to comply with the law, the court will not punish him for the default of others. The duties placed on him by the statute will put him to some trouble. Organized society is entitled to demand such services of any citizen, however, for the health and safety of all, just as for the same reasons, the property of any citizen may be destroyed, without compensation.

## Society Proceedings

### COMING MEETINGS

Am. Assn. Obstetricians and Gynecologists, Newark, N. J., Sept. 17-19.
American Electro-Therapeutic Association, Atlantic City, Sept. 11-13.
American Roentgen Ray Society, Pittsburgh, Sept. 19-22.
Colorado State Medical Society, Colorado Springs, Sept. 25-27.
Indiana State Medical Association, Evansville, Sept. 26-28.
Michigan State Medical Society, Battle Creek, Sept. 4-6.
Minnesota State Medical Association, St. Paul, Oct. 10-20.
Mississippi Valley Medical Association, Toledo, O., Oct. 9-11.
Missouri Valley Medical Society, Lincoln, Neb., Sept. 20-21.
Pennsylvania State Medical Society, Pittsburgh, Sept. 24-27.
Utah State Medical Association, Salt Lake City, Sept. 12-13.
Vermont State Medical Society, Barre, Oct. 11-12.
West Virginia State Medical Association, Fairmont, Oct. 2-4.
Wisconsin State Medical Society, Milwaukee, Oct. 3-5.

## Current Medical Literature

### AMERICAN

Titles marked with an asterisk (*) are abstracted below.

#### American Journal of Diseases of Children, Chicago

*August, XIV, No. 2*

1 Epidemiologic Data in Poliomyelitis Epidemic in New York State. M. Nicoll, Jr., Albany, N. Y.—p. 69.
2 Infant Welfare Work in War Time. G. L. Meigs, Washington, D. C.—p. 80.
3 *Uric Acid Content of Blood in New-Born. J. P. Sedgwick and F. B. Kingsbury, Minneapolis.—p. 98.
4 *Effect on Human Milk Production of Diets Containing Various Forms and Quantities of Protein. B. R. Hoobler, Detroit.—p. 105.
5 *Congenital Skin Defects. I. A. Abt, Chicago.—p. 113.

3. **Uric Acid Content of Blood in New-Born.**—A parallelism between the high uric acid content of the blood of the newborn and the high excretion of this substance during the first three or four days of life was found by Sedgwick and Kingsbury. They regard this as indirect evidence that human fetal tissues possess no uricolytic power, for it would be difficult to imagine so great a production of uric acid if the tissues themselves possessed the power to destroy it. Whether the decomposition of nuclein material, which must be looked on as the cause of this uric acid increase in the blood, is related to the striking changes in the blood cells, particularly in the changes in the partition of the white corpuscles taking place at this time, or to nuclein destruction in other parts of the body, as yet unknown, or to both, must be left to the future to decide. These results fit in well, however, as the con-

necting link in the theoretical chain of early leukocytosis — fall in leukocytes — flood of uric acid in the blood — high uric acid excretion — uric acid infarcts.

4. **Effect of Diet on Human Milk Production.**—This problem was studied by Hoobler, the subjects being healthy nursing mothers. He found that a nutritive ratio of 1:6 or narrower seems best adapted to the need of nursing mothers. (This ratio refers to the proportion of digestible protein to digestible fat and carbohydrate, the latter reduced to a carbohydrate basis.) Animal protein is more suitable than vegetable protein in supplying nitrogen for milk and maintenance of nitrogen balance. The protein derived from nuts when fed with other vegetable protein is suitable for supplying milk protein and for maintaining nitrogen equilibrium. A diet composed exclusively of cereals, fruits and vegetables does not supply sufficient protein for elaborating milk protein and causes a severe drain on tissues of mother. Of the various forms of animal protein, that which is derived from cow's milk seems particularly suitable for the production of human milk protein, as well as for the preservation of maternal tissues.

5. **Congenital Skin Defects.** — In Abt's case there was a defective skin area over each knee. These areas were about 1 by 1¼ inches in size; almost identical in size and shape. The skin around the edges was drawn and puckered, presenting the appearance of ulcers with irregular edges. The base was beefy-red and moist. A few small foci on this red, ulcerated surface showed a yellow exudate. A whitish scar seemed to cross the ulcerated area, appearing like a connective tissue band, which indicated the beginning of cicatrization. From week to week the ulcers gradually covered over, so that after five or six weeks the denuded, red areas were replaced by shiny, white patches, somewhat lighter in color than the surrounding skin. The healing process was complete, and the baby appeared normal in every respect.

### American Journal of Physiology, Baltimore

*August, XLIV, No. 1*

6 Bio-Assay of Veratrum Viride. J. D. Pilcher, Omaha, Neb.—p. 1.
7 *Production in Dogs of Pathologic Condition Which Closely Resembles Human Pellagra. R. H. Chittenden and F. P. Underhill, New Haven, Conn.—p. 13.
8 Contraction of Smooth Muscle Cells in Tissue Cultures. M. R. Lewis and W. H. Lewis.—p. 67.
9 *Effect of Emotions on Catalase Content of Liver. W. E. Burge and E. L. Burge.—p. 75.
10 Electrodes Used in Electrocardiography. H. E. B. Pardee.—p. 80.
11 Response of Respiratory Mechanism to Rapid Changes in Reaction of Blood. J. P. Peters, Jr., New York.—p. 84.

7. **Production of Pellagra-Like Conditions in Dogs.**—Chittenden and Underhill found that dogs fed on a diet consisting of boiled (dried) peas, cracker meal, cotton seed oil or lard, rapidly develop symptoms indicating abnormal nutrition. This condition eventually terminates in death. Previous to the development of the pathologic manifestations, the dogs are usually in nitrogen balance and exhibit excellent food utilization. The nitrogen partition of the urine is normal when compared to that of animals maintained on the same level of nitrogen intake. The pathologic symptoms at times can be made to disappear and the normal conditions of nutritive rhythm can be reestablished by addition of meat to the dietary. In the production of the symptoms, it is immaterial whether the transition from a diet containing meat to one of vegetable origin is sudden or gradual. The final outcome is the same in both cases. The intake of a large quantity of peas is less detrimental than smaller amounts. In the development of the pathologic condition, the level of nitrogen intake as such plays little or no rôle. The typical symptoms may be induced in dogs, but with much greater difficulty when a diet containing meat, cracker meal and lard is fed in appropriate quantities. For the production of the diseased condition, the meat intake must be reduced to a certain undefined minimum. Under these circumstances less than 50 per cent. of dogs exhibit pathologic symptoms and these may appear in periods of two to eight months. From the facts enumerated the conclusion seems tenable that the abnormal state may be referred to a deficiency of some essential dietary constituent or constituents, presumably belonging to the group of hitherto unrecognized but essential components of an adequate diet.

9. **Effect of Emotions on Catalase Content of Liver.**—Evidence is presented by the Burges to show that the fighting emotions, and probably exercise, increase greatly the catalase content of the liver, and that this catalase is given off to the blood and is carried to the tissues to be used presumably in producing increased oxidation.

### American Journal of Public Health, Boston

*July, VII, No. 7*

12 Tuberculosis in France. H. Biggs, New York.—p. 606.
13 Observations and Experiments on Dishwashing. W. A. Manheimer and T. Ybanez, New York.—p. 614.
14 Enforcement of Registration of Births and Deaths in Metropolitan Areas—History, Methods, Results and Checks. W. H. Guilfoy, New York.—p. 619.
15 Use of Vital Statistics in Epidemiologic Studies. A. W. Freeman. —p. 624.
16 Modern Hygiene of Typhus Fever. Its Application at Port of New York. J. R. Hicks.—p. 628.
17 Present Status of and Necessity for Mouth Hygiene. S. J. Rauh.—p. 631.
18 Monthly Schedule for Health Officers. H. B. Wood, Charleston, W. Va.—p. 637.
19 Stammering in Connection with Military Service. E. Tompkins, Los Angeles.—p. 638.

### American Journal of Syphilis, St. Louis

*July, I, No. 3*

20 Treatment of General Paresis; Report of Fifty-Five Cases. H. S. Ogilvie, New York.—p. 509.
21 *Response in Treatment of Syphilis of Central Nervous System. H. F. Swift, New York.—p. 524.
22 *Complement Fixation in Syphilis. L. Thompson, Hot Springs, Ark.—p. 555.
23 Six Cases of Aortic Aneurysms and Dilatations. P. G. Woolley, Cincinnati.—p. 582.
24 Serologic Examination of Over Two Hundred Children from Open Air Schools of St. Louis. C. D. Johnson, St. Louis.—p. 606.
25 Value of Complete Examination of Ear in Syphilis. J. W. Downey, Jr., Baltimore.—p. 616.
26 Presenting Symptoms in Three Hundred Consecutive Cases of Syphilis. R. H. Lafferty and S. R. Thompson, Charlotte, N. C. —p. 624.
27 Provocative Wassermann Test in Clinical Diagnosis of Syphilis. J. H. Stokes and P. A. O'Leary, Rochester, Minn.—p. 629.
28 Cases of Hypertrophic Cirrhosis of Liver. P. G. Woolley, Cincinnati.—p. 649.
29 Luetin Reaction in Cardiovascular-Renal Diseases; Report of Thirty-Three Cases. D. Fulton and R. Cummings, Los Angeles. —p. 663.
30 Treatment of Syphilis with Galyl. L. Thompson, Hot Springs, Ark.—p. 665.

21. **Treatment of Syphilis of Central Nervous System.**—Swift calls attention to the fact that before undertaking the treatment of a patient with any form of cerebrospinal syphilis, it is important to determine what symptoms are due to inflammation or exudation and what are due to degeneration of tracts or cortex. It is also advisable to determine the intensity of the irritative condition as indicated by the cerebrospinal fluid. In general, the lesions due to inflammation or exudation are much improved or eliminated by the general treatment of the patient. Those due to degeneration are little, if any, affected. Treatment should be directed not only toward the elimination of symptoms, but toward the elimination of the underlying process, namely, syphilis. In most patients with early meningitis, and in those with what was formerly termed tertiary syphilis of the central nervous system, the symptoms due to exudation respond in a satisfactory manner to the general administration of salvarsan, mercury and potassium iodid. Occasionally, a case is met in which intraspinal treatment seems to be necessary in order to eradicate completely the central nervous lesions. Likewise in tabes dorsalis, many cases respond satisfactorily to the general administration of salvarsan and mercury. On the other hand, in a considerable number of tabetics, the addition of intraspinal injections of serum to intravenous treatment with salvarsan seems to hasten the elimination of abnormal elements in the cerebrospinal fluid and lead to a permanent arrest of the degeneration. It is advisable to continue the treatment of patients suffering from cerebrospinal syphilis or tabes dorsalis until the cerebrospinal fluid is normal and remains so. A possible exception may be made in reference to excess globulin, for an increased globulin is not infre-

quently found years after all other abnormal elements have disappeared from the fluid.

In paralytic dementia, while much benefit may be expected in increasing the number and length of remissions, the ultimate hope for recovery is slight. When a paretic type of gold curve is found in the fluid of patients in whom the clinical diagnosis of paresis is not justified, the most intensive form of treatment should be instituted from the beginning. It is probable that the finding of this paretic type of gold curve often helps us to make a diagnosis of paresis before clinical symptoms of the disease are present. This early diagnosis with consequent early treatment may be of extreme importance in preventing the development of the outspoken condition. Finally, treatment must be individualized, given in courses, and the condition of the fluid determined at the end of each course and at the beginning of the subsequent course. In this way, the indication for kind of treatment, as well as the manner of response, is much more certainly determined than if one depends on clinical symptoms and objective findings alone.

22. **Complement Fixation in Syphilis.**—The patient's serum is used in the fresh, noninactivated state in quantities sufficient to insure the presence of sufficient syphilitic antibodies to bind complement when such antibodies are present at all; the complement is derived from the patient's serum and is accurately titrated; the amboceptor is the serum of rabbits immunized against human red blood cells; the antigen is the acetone insoluble lipoids of Noguchi and Bronfenbrenner, while the corpuscles are thoroughly washed human erythrocytes from any convenient source, usually from one of the patients whose serum is being tested.

### Arkansas Medical Society Journal, Little Rock

*July, XIV, No. 2*

31 Fibroid Uterus in Young; Report of Cases. E. L. Beck, Texarkana.—p. 34.
32 Hematoma of Skull. H. H. Rightor, Helena.—p. 35.
33 Paraffin Treatment for Burns. N. Mumey, Little Rock.—p. 36.
34 Fracture of Left Patella. J. M. Lemons, Pine Bluff.—p. 38.

### Boston Medical and Surgical Journal

*August 2, CLXXVII, No. 5*

35 *When Is Diagnosis of Tuberculosis Without Positive Sputum Justified? D. R. Lyman, Wallingford, Conn.—p. 135.
36 *Diagnosis of Tuberculosis in Children. H. D. Chadwick and R. Morgan, Westfield, Mass.—p. 138.
37 What Should Constitute Reportable Tuberculosis. F. G. Curtis, Newton, Mass.—p. 141.
38 Definitions and Diagnostic Standards in Diagnosis of Pulmonary Tuberculosis in Adults. J. B. Hawes, Boston.—p. 145.
39 Clinical Data of Gallbladder Disease. R. W. French, Fall River, Mass.—p. 151.
40 Occupational Diseases in Massachusetts. T. F. Harrington, Boston.—p. 153.

35. **Diagnosis of Tuberculosis Without Positive Sputum.**—The records of 1,638 cases of tuberculosis discharged from Gaylord Farm in the past twelve years show 1,076 in which the sputum was positive and 562 with no bacilli. The 562 negative cases were divided as follows: incipient, 244; moderately advanced, 297; far advanced, 21; more than half showing well-developed lung signs. In fifty-one cases there was tuberculosis elsewhere; eighteen had pleurisy with effusion, 126 had hemorrhage—and these included only frank hemorrhage, and not blood-streaked sputum—ninety-seven gave positive tuberculin reactions to doses ranging from 1 to 7 mg. of old tuberculin given subcutaneously, and seventy-six died from tuberculosis after discharge. The study of the records of those having positive findings, Lyman points out, emphasizes again the futility of depending on sputum for diagnosis. In 213 of these 1,076 cases with positive sputum, the sputum was negative occasionally; in 56 it was negative as often as positive; in 42 negative twice for each positive finding; in 63 negative three times for each positive finding; in 70 negative five times; and in 39 negative ten times for each positive finding. Thus of 1,076 positive cases, in 483 the sputum at times would have failed to support the clinical diagnosis, and of 1,638 cases, in only 593 was the sputum positive at all examinations. Lyman says that in making a diagnosis of pulmonary tuberculosis in the face of negative sputum findings the data necessary are: first, the history of the case; second, the symptoms presented; and, third, the physical signs.

36. **Diagnosis of Tuberculosis in Children.**—Summarizing the essentials for a minimum standard necessary in the diagnosis of tuberculosis in children, Chadwick and Morgan emphasize the importance of symptoms indicating tuberculin absorption, namely: weakness, undue fatigue, fever, poor appetite, failure to gain, or loss of weight, and nervous irritability. The local symptoms are cough, hoarseness and occasionally streaked sputum. The usual physical signs are dulness in the interscapular region radiating into the apices at the back, frequently not elicited in front. There may or may not be changes in the respiratory sounds. Râles may or may not be present. Symptoms both constitutional and local, together with a history of exposure, are to be given greater weight in making a diagnosis of active tuberculosis than the presence or absence of physical signs. Percussion is more important than auscultation. A thickened area in the lung or region of the bronchial glands does not in itself mean active tuberculosis. It may be a healed lesion that needs no treatment. Such thickening may also be caused by other diseases than tuberculosis. The child showing constitutional symptoms, even without local signs of disease in the chest, should be considered suspicious, kept under careful observation and hygienic treatment instituted in the home. The case with signs in the chest, without constitutional symptoms, indicates an old inactive infection that needs no treatment. Individualization and common sense must be used to weigh all the factors in the case, and, with experience as a guide, few errors in diagnosis will be made.

### Canadian Medical Association Journal, Toronto

*July, VII, No. 7*

41 Canadian Medical Association. A. D. Blackader, Montreal.—p. 577.
42 Slight Variations from Normal Structure and Function, and Their Clinical Significance. T. C. Janeway, Baltimore.—p. 589.
43 Corpus Callosum: Morphologic and Clinical Study. J. Cameron, Halifax.—p. 609.
44 Pyelitis. J. R. Fraser, Montreal.—p. 617.
45 Classification of Cases of So-Called Shell Shock. H. P. Wright.—p. 629.
46 Fragilitas Ossium; Report of Case. A. Goldbloom, Montreal.—p. 636.
47 Traumatic Extraperitoneal Rupture of Bladder with Fracture of Pelvis. M. O. Klotz, Ottawa.—p. 641.

### Journal of Experimental Medicine, Baltimore

*August, XXVI, No. 2*

48 *Studies in Glomerulonephritis. Quantitative Study of Reaction of Kidney to Diphtheria Toxin. H. K. Faber, San Francisco.—p. 139.
49 Id. Form of Acute Glomerulonephritis Produced with Diphtheria Toxin and Bacillus Coli. H. K. Faber, San Francisco.—p. 153.
50 *Experimental Studies on Lymphocytes. Action of Immune Serums on Lymphocytes and Small Thymus Cells. A. M. Pappenheimer, New York.—p. 163.
51 *Mechanism of Urea Retention in Nephritis. F. C. McLean, New York.—p. 181.
52 Experiments on Causation and Amelioration of Epinephrin Pulmonary Edema. J. Auer and F. L. Gates, New York.—p. 201.
53 *Effects of Experimental Plethora on Blood Production. O. H. Robertson, New York.—p. 221.
54 *Experimental Study of Organization in Lobar Pneumonia. B. S. Kline, New York.—p. 239.
55 Growth of Ovarian Follicle of Guinea-Pig Under Normal and Pathologic Conditions. L. S. N. Walsh, St. Louis.—p. 245.
56 *Relation of Apical Tuberculosis of Adults to Focal Tuberculosis of Children. E. L. Opie, St. Louis.—p. 263.
57 Cicatrization of Wounds. Influence on Healing of Wounds of Variations in Osmotic Tension of Dressing. A. Carrel, P. L. du Noüy and A. Carrel, France.—p. 279.

48. **Studies in Glomerulonephritis.**—Faber found that diphtheria toxin of known strength, injected intravenously into rabbits in single doses, produces lesions which are first evident in the endothelium of the tufts, and possibly in the intertubular capillaries. Evidence is presented to show that epithelial damage in the tufts and especially in the tubules is secondary to the vascular injury. The severity of the lesions was roughly proportional to the amount of toxin injected. It is suggested that the localization of lesions in the tufts is due to the concentration of toxin in the blood that follows the loss

of water at this point. It is further suggested that this inference may be extended to explain the pathogenesis of the so-called intracapillary form of glomerulonephritis.

50. **Action of Immune Serums on Lymphocytes and Thymus Cells.**—Pappenheimer's experiments indicate that the lymphotoxic and agglutinative factors are to a considerable degree distinct from the hemolytic and hemagglutinative ones, since they can be separated from one another by absorption. Evidence is presented that the small thymus cells are biologically related to, if not identical with, the lymphocytes derived from lymph glands.

51. **Urea Retention in Nephritis.**—Urea retention, in the sense of a relatively increased concentration in the blood, McLean believes is the result of increased resistance to the excretion of urea through the kidneys. The relatively increased concentration of urea in the blood overcomes the increased resistance to excretion, and the organism is thereby maintained in nitrogenous equilibrium. The laws formulated by Ambard for the excretion of urea apply in the condition of urea retention under a widely varying range of conditions as to nitrogen intake and excretion. The numerical value of Ambard's constant changes in urea retention, but the relation of the variable factors to one another remains otherwise unchanged. In certain individuals, with otherwise normal findings in regard to urea excretion, an unusual degree of constancy, to which McLean applies the term fixation, has been found in the numerical results obtained by the application of Ambard's laws. These individuals are regarded, as the result of this study, as probably abnormal, but the pathologic significance of the fixation has not been determined.

53. **Experimental Plethora and Blood Production.**—The finding by Robertson that the activity of the bone marrow can be depressed by the introduction of a large quantity of blood into the circulation accounts for the diminished bone marrow activity which sometimes occurs after transfusion in pernicious anemia. In such cases there is a marked drop in the number of reticulated cells and other evidence of bone marrow depression; the patient shows no benefit from transfusion or may grow rapidly worse. The cause of this depression is best explained on the basis that in severe instances of the disease where exhaustion of the bone marrow is imminent, the stimulus of the anemia is only just sufficient to keep the marrow functioning. A sudden lowering of this stimulus is brought about by the introduction of a large quantity of blood into the circulation and the result is a fall in the activity of the bone marrow. It follows from this that in pernicious anemia with a feebly reacting bone marrow as indicated by the number of reticulated red cells, small transfusions are preferable to large ones.

54. **Organization in Lobar Pneumonia.**—Experiments reported by Kline give evidence that in unresolved lobar pneumonia, the persistence of the exudate, followed by organization, depends on the presence of serum in the exudate.

56. **Tuberculosis of Adults and of Children.**—The following observations by Opie indicate that apical tuberculosis of adults is not the result of infantile tuberculosis but is caused by subsequent infection: (*a*) Apical tuberculosis does not have its highest incidence, in accordance with common belief, in early adult life when focal infections acquired in childhood are relatively fresh and active, but is more common in later life when the focal lesions of childhood have in most instances completely healed. It is noteworthy that most of these apical lesions of later life pursue a chronic course and are discovered at necropsy in individuals who have died from other causes; (*b*) the well characterized lesions of tuberculosis acquired in childhood and found in adults with apical lesions are almost invariably calcified and healed. The apical lesion is in most instances relatively fresh and caseous whereas the focal pulmonary lesion and associated lesions of regional lymphatic nodes exhibit no evidence of activity; (*c*) in a large proportion of instances of associated focal and apical tuberculosis the focal lesion is in one lung, whereas the apical lesion is limited to the opposite apex. This relation affords no support to the view that tuberculous lesions may be transmitted to the apex by way of the lymphatics.

## Journal of Infectious Diseases, Chicago

*August, XXI, No. 2*

58 *Epidemiology of Pellagra in Nashville, Tennessee. J. W. Jobling, W. F. Petersen, B. G. Tucker and F. C. Costen, Nashville, Tenn.—p. 109.
59 *Development of Antibodies for Bacillus Typhi-Exanthematici in Typhus Fever Contacts. G. Baehr, New York.—p. 132.
60 Fecal Examinations of Regiment Infected with Bacillus Paratyphosus A, with Special Reference to Normal Carriers. C. Krumwiede, Jr., New York.—p. 141.
61 Isolation of Typhoid Bacilli from Urine. Kan-Ichiro Morishima and O. Teague, New York.—p. 145.
62 *Results of Blood Cultures in Rheumatoid Arthritis. V. H. Moon and S. R. Edwards, Indianapolis.—p. 154.
63 Correlations in Colon Aerogenes Group. L. V. Burton and L. F. Rettger, New Haven, Conn.—p. 162.
64 *Tuberculosis of Lymph Nodes. Frequency, Origin and Relation to Other Tuberculous Lesions, Especially Pulmonary Tuberculosis. F. Harbitz, Christiania, Norway.—p. 196.
65 Comparisons of Rate of Gas Production by Certain Bacteria in Raw and in Pasteurized Milk. P. W. Allen, Urbana.—p. 219.

58. **Epidemiology of Pellagra.**—As a result of the surveys carried on by Jobling and Petersen during the past two years in the city of Nashville, some fairly well established facts are presented. Considering the relation of the diet to pellagra, two factors stand out which are contradictory. On the one hand, a definite number of cases develop in individuals partaking of a diet as varied and as wholesome as could be demanded by any advocate of the dietary theory, and cases of pellagra have developed in breast-fed infants of nonpellagrous mothers. On the other hand, at least half of the cases develop in persons living on a ration low in protein, high in carbohydrates, and monotonous in character. Admittedly, too, the pellagrous condition is favorably influenced by a change in diet.

59. **Antibodies in Typhus Fever Contacts.**—Twenty persons who did not have typhus fever clinically were examined as to blood antibodies. Specific antibodies in high titer were found. Every one of these twenty individuals had recently been in intimate contact with typhus fever. They were either physicians, nurses and hospital attendants who were handling typhus fever patients, or they were friends or members of families in which typhus fever had recently occurred. Of these twenty typhus contacts, three, after their exposure to infection, had had vague, general symptoms indisguishable from an influenza. All the others had been well. Baehr holds that the observation that individuals after exposure to typhus fever may fail to develop the disease, and yet may react with the production of specific antibodies against *Bacillus typhi-exanthematici* is incontrovertible evidence as to the etiologic significance of the *Bacillus typhi-exanthematici.*

62. **Blood Cultures in Rheumatoid Arthritis.**—Forty cases of acute arthritis and 83 cases of chronic arthritis were examined bacteriologically by Moon and Edwards. Nonhemolytic streptococci were found in 13 of the acute cases; hemolytic streptococci in one case; *Bacillus mucosus-capsulatus* in 2 and a diphtheroid bacillus in 2; staphylococcus aureus in one case; 21 were negative. In the chronic cases nonhemolytic streptococci were found in 18 cases; *Bacillus mucosus-capsulatus* in 3; diphtheroid bacilli in 3; unidentified organisms in 1 case; 58 were negative. The probable source of infection was not always determined, but, tonsils and teeth stand out prominently. The results of autogenous vaccine treatment when consistently carried out were for the most part gratifying, especially in the chronic cases, though there were cases in which little or no improvement was evident. In making a statement regarding results of vaccine treatment the authors have not lost sight of the tendency of infection to spontaneous improvement or recovery, nor of the fact that in most of these cases improved hygienic conditions, rest and tonics were also factors. Little permanent improvement is to be secured in chronic progressive arthritis by improved hygienic conditions, rest and tonics alone, yet a number of cases showed a marked permanent improvement when these measures were combined with autogenous vaccines.

64. **Tuberculosis of Lymph Nodes.**—Harbitz's observations are based on 2,906 necropsies, of which 2,489 were of adults, that is, persons over 15, and 417 children, that is, persons

under 15. Of these cases, 431, 14.8 per cent., died of tuberculosis; including advanced tuberculosis in persons dead from other causes, the deaths numbered 501, that is, 17 per cent. Of the adults, 351, 14 per cent., died of tuberculosis; of the children, 80, or 19 per cent. In 203 cases considerable tuberculosis of the lymph nodes was found, that is, in 7 per cent., 127 cases, 5 per cent., being in adults, and 76, 18.2 per cent., in children. Tuberculosis of the bronchial lymph nodes: 57 cases. All were fatal except 2. In most of the cases death resulted from a secondary miliary tuberculosis or tuberculous meningitis. Primary extensive tuberculosis in the cervical lymph nodes: 10 cases, all in adults. Eight died of tuberculosis. Old primary extensive tuberculosis in abdominal lymph nodes: 9 cases, 3 dying of tuberculosis. Extensive old chronic lymph node tuberculosis in the neck and chest: 40 cases, of which 3 are doubtful. Of the 23 who died from tuberculosis, 9 died of a secondary lung tuberculosis, 7 of miliary tuberculosis and tuberculous meningitis, 2 of tuberculosis of the serous membranes, 1 child of spondylitis, 1 adult of intestinal tuberculosis, 2 adults of urogenital tuberculosis, and 1 of secondary amyloid degeneration. Primary contemporaneous old tuberculosis in cervical and abdominal lymph nodes: 1 was fatal. Extensive inveterate tuberculosis of the thoracic and abdominal lymph nodes: 22 cases, 19 fatal. The cause of death was miliary tuberculosis (2); primary (?) intestinal tuberculosis (4); urogenital tuberculosis (3); tuberculosis in the suprarenals with Addison's disease (3); tuberculosis of serous membranes (1); secondary (?) pulmonary tuberculosis (3); tuberculosis in the bone, pericarditic pseudocirrhosis in a boy of 13; and a peculiar symptom complex with fever and anemia. General lymph node tuberculosis: 61 cases. In all these cases with one exception tuberculosis was the cause of death.

The lymph nodes in the neck, in the thorax, and in the abdomen were markedly and extensively affected. Occasionally, there was also a similar process in the axillary and inguinal nodes. Frequently there was a descending process in the neck, most marked above, and reaching down into the supraclavicular spaces; next in the thorax along the trachea, least marked above, down to the bifurcation and pulmonary hilus where the masses usually were largest, and then along the bronchi. Apparently, there was a continuous series of infected lymph nodes, but the extent decreases downward in the neck and upward along the trachea. In the abdomen there was generally a more isolated tuberculosis, either in the mesenteric nodes only or in the retroperitoneal nodes, sometimes in high degree and in the upper part of the abdomen, along the aorta, the celiac axis, or in the hilus of the liver and spleen. Consequently, in general, it does not appear that the coarser anatomic conditions point to a continued and continuous spread along the lymph vessels from one point and from one place to another.

### Journal of Nervous and Mental Diseases, Lancaster, Pa.

*July, XLVI, No. 1*

66 Disease and Symptoms. Plea for Wider Generalization. E. W. Taylor.—p. 1.
67 *Effect on Papilledema of Removal of Small Quantities of Cerebrospinal Fluid by Lumbar Puncture. W. G. Spiller and G. E. de Schweinitz.—p. 10.
68 *Virilism-Forme Fruste. H. K. Marks, New York City.—p. 17.
69 Mechanism Producing Hysterical Abdominal Distention. W. I. Lillie, Ann Arbor, Mich.—p. 35.
70 *Carcinoma of Spine—Case of Cauda Equina Disease Following Thyroid Metastasis. A. Skversky, New York City.—p. 40.

67. **Removal of Cerebrospinal Fluid.**—In three cases observed by Spiller and de Schweinitz removal of a few cubic centimeters of cerebrospinal fluid had a remarkable effect on swelling of the optic nerves. In the first patient, a decrease of 1 diopter was noticed after each lumbar puncture. Two of these cases from a preliminary examination strongly suggested brain tumor, but after a more careful study the diagnosis of encephalitis was made in one case and of pseudotumor from intoxication or infection in the other.

68. **Virilism.**—On the basis of twenty-two observations, the proposition is made by Marks that a type of virilism exists which corresponds essentially to the clinical picture of the *virilisme surrenal* of Gallais; but which is attenuated and compatible with life; in a word, a virilism, *forme fruste*. Although postmortem support is lacking, the clinical analogies are striking and constant. That the interrenal tissue plays a rôle, probably the most important rôle in the development of the syndrome is more than likely; but the remaining endocrine glands cannot be left out of account; notably the pituitary, pineal and ovaries. The primary disturbance would seem to lie in the resultant of a balance of power between the cortical tissue and the ovaries. On the hypothesis proposed by Marks, the ovaries would have the function of guarding and conserving the female characters, while at the same time inhibiting the development of male characters. If for any reason, pathologic or physiologic, temporary or permanent, this balance of power falls to the interrenal tissue, then male characteristics tend to appear. Granted the existence of virilism, *forme fruste*, it is apparent that an interesting field of inquiry is opened up from a sociologic and eugenic point of view; likewise questions that touch on the "infantile trauma" of Freud in the origin of homosexual traits.

70. **Carcinoma of Spine.**—Skversky's patient, male, aged 52, complained of pain in both hips, radiating down the legs, so that he was unable to walk for any distance. The illness dated back two years with cutting pains in the left lower limb, commencing above the pelvis, and radiating down the inner side of the ankle. About six months later, he began to experience similar pains in the right lower limb. The pain, which was very severe, was not constant nor definitely localizable, but mostly in his legs and ankles, never in his feet. While in bed he found comfort only when lying on either side, and turning over was accompanied by sharp pains in the back of the pelvis. There was no pain on urination or defecation. He was able to walk slowly and guardedly, with the aid of a cane, but while on his feet appeared to be suffering from pain. Examination of the neck did not reveal any thyroid enlargement; no abnormal masses were felt, nor was any apparent enlargement of the regional lymphatics present. Examination of the spine did not reveal any deformities, rigidity, tender areas or alteration in consistency; in fact, no pathology was found. In the absence of objective organic features, the case was, for the time being, considered to be probably of a functional nature. The roentgenologist reported slight evidence of a defect in the outlines of the left border of the body of the fourth lumbar vertebra, but added that this was probably an artefact and of no significance. Three months later he reported bone defect involving the left half of the body of the fourth lumbar vertebra, also small contiguous portions of the third and fifth vertebrae. The patient began to show evidence of rapid loss of weight, and a peculiar yellowish-brown cachexia. Death occurred inside of two weeks. The necropsy disclosed an adenocarcinoma of the thyroid with metastases in the lower portion of the third and upper portion of the fifth vertebrae, including the intervertebral disks, encroaching on the spinal canal, although not penetrating the meninges. It proved to be thyroid adenoma, replacing atrophic bone, with no evidence of new bone formation. The primary seat of the neoplasm was not recognized for obvious reasons, but the prostate at one time felt suspiciously enlarged, and although toward the end it did not suggest malignancy, it was considered as the probable primary site of the disease. At no time during the clinical course was there anything to suggest thyroid disease.

### Nebraska State Medical Journal, Norfolk

*July, II, No. 7*

71 Arteriosclerosis and Hypertensions from Standpoint of General Practitioner. J. C. Waddell, Pawnee City.—p. 347.
72 Icterus. A. Sachs, Omaha.—p. 351.
73 Chronic Intestinal Stasis, Clinically and Surgically. A. E. Watson, Grand Island.—p. 355.

### New Orleans Medical and Surgical Journal

*August, LXX, No. 2*

74 Appendicitis Complicating Pregnancy. A. P. Heineck, Chicago.—p. 113.
75 Practical Methods of Preventing Diseases in Communities with Results Accomplished in Shreveport. G. C. Chandler, Shreveport.—p. 127.
76 Treatment of Pneumonia in Early Life. L. R. DeBuys, New Orleans.—p. 137.

77 Removal of Appendix in Abscess Cases. H. B. Gessner, New Orleans.—p. 148.
78 Hodgkin's Diseaese; Report of Apparently Cured Case. D. O. Willis, Leesville.—p. 156.
79 Laboratory Contributory Aid in Care of Pneumonia. J. C. Cole, New Orleans.—p. 165.
80 Importance of Early Diagnosis in Mental Disorders. R. M. Van Wart, New Orleans.—p. 170.
81 Extreme Prognathism Relieved by Bilateral Resection of Mandible. H. B. Gessner, New Orleans.—p. 176.

### Ohio State Medical Journal, Columbus

*August 1, XIII, No. 8*

82 Treatment of Third Stage of Labor. J. J. Thomas, Cleveland. —p. 541.
83 Ravages of Alcohol on Central Nervous System. H. H. Drysdale, Cleveland.—p. 544.
84 Case of Small Round Cell Sarcoma of Dura of Spinal Cord. C. E. Kiely, Cincinnati.—p. 549.
85 Printers' Ink—Publicity and Public Health. J. R. McDowell, Columbus.—p. 552.

### Public Health Journal, Toronto

*July, VIII, No. 7*

86 Variola. J. B. Boyle, Casselman.—p. 163.
87 State Wide Education in Social Hygiene. W. T. Foster.—p. 167.
88 Rochester Bureau of Health Consultation. G. W. Goler, Rochester, N. Y.—p. 172.
89 Illegitimate Child. J. J. Kelso.—p. 174.
90 Illegitimacy, Preventive Aspects. M. Patterson, Toronto.—p. 176.
91 Scarlet Fever. J. C. Hutchinson, Graften.—p. 177.
92 Scavenging; Is Standardization Worth While? D. Little, Winnipeg.—p. 181.

### Rhode Island Medical Journal, Providence

*August, I, No. 8*

93 Recognition and Treatment of Some Conditions of Foot. E. W. Burt, Providence.—p. 167.
94 Study of Internal Secretions; Report of Five Cases. A. H. Ruggles, Providence.—p. 170.
95 Perforation of Duodenum Due to Retroperitoneal Fibrosarcoma. C. S. Christie and H. S. Bernstein, Providence.—p. 175.
96 Case of Malignant Pustule. L. deMello, Providence.—p. 176.

### South Carolina Medical Association Journal, Greenville

*July, XIII, No. 7*

97 Medical Examination of Schoolchildren of City of Florence, S. C. M.R. Mobley, Florence.—p. 599.

### Southwest Journal of Medicine and Surgery, El Reno, Okla.

*July, XXV, No. 7*

98 Focal Infections. A. B. Leeds, Chickasha.—p. 157.
99 Surgical Acidosis. W. E. Dicken, Oklahoma City.—p. 163.
100 Electrotherapy. J. Y. Simpson, Kansas City, Mo.—p. 173.
101 Heat in Cancer of Uterus. F. A. Hoge, Fort Smith, Ark.—p. 176.
102 Focal Infections. W. H. Livermore, Chickasha.—p. 179.

### Surgery, Gynecology and Obstetrics, Chicago

*August, XXV, No. 2*

103 Gas Bacillus Infection in France. J. R. Judd, Honolulu, Hawaii. —p. 113.
104 *Operative Treatment of Inaccessible Vesicovaginal Fistulas. G. G. Ward, Jr., New York.—p. 126.
105 *Surgical Methods of Dealing with Pelvic Infections. T. S. Cullen, Baltimore.—p. 134.
106 Treatment of Cystocele and Uterine Prolapse. T. J. Watkins, Chicago.—p. 147.
107 *Hemolytic Jaundice; Review of Seventeen Cases. H. Z. Giffin, Rochester, Minn.—p. 152.
108 Perforations of Gastric and Duodenal Ulcers. B. B. Davis, Omaha. —p. 162.
109 Peritoneal Adhesions. J. F. Corbett, Minneapolis.—p. 166.
110 *Webs and Pouches of Esophagus; Their Diagnosis and Treatment. H. P. Mosher, Boston.—p. 175.
111 *Surgical Treatment of Banti's Disease; Report of Three Cases. C. D. Lockwood, Pasadena, Calif.—p. 188.
112 Gangrenous Cholecystitis; Report of Case Due to Gas Bacillus. G. G. Cottam, Sioux Falls, S. D.—p. 192.
113 Abuse of Cesarean Section. J. W. Williams, Baltimore.—p. 194.
114 Study of Fetal Maturity in Utero. C. B. Reed, Chicago.—p. 201.
115 Use of Desiccated Placenta. E. Cary, Chicago.—p. 206.
116 Harelip. W. A. Bryan, Nashville, Tenn.—p. 209.
117 Suspension in Bronchoscopy and Esophagoscopy. R. C. Lynch, New Orleans.—p. 213.
118 Radical Treatment of Intestinal Obstruction and Gangrene of Intestine; Report of Two Cases. H. Shoemaker, Los Angeles. —p. 217.

104. **Treatment of Inaccessible Vesicovaginal Fistulas.**—The following points in the closure of inaccessible vesicovaginal fistulas by the vaginal route are emphasized by Ward. Schuchardt's incision is the most effective means by obtaining free access to the vaginal vault for operative procedures in difficult cases. Free mobilization of the bladder is an essential requisite to the successful closure of inaccessible vesicovaginal fistulas. Displacement of the bladder injury downward within reach by means of a sound in the bladder used as a lever and counterpoint is a decided aid. The sutures in the bladder and vaginal walls should be placed in such a manner that the lines of incision are not superimposed.

105. **Surgical Treatment of Pelvic Infections.**—Emphasis is laid by Cullen on the following: When an appendix abscess is opened the appendix can practically always be removed at the same time, provided the abscess is well walled-off with gauze before an attempt is made to open it. In removing a large pus tube that is firmly adherent to the pelvic floor, it is better to begin by excising a wedge of the uterine cornu and gradually freeing the mesosalpinx. The tube can then be lifted up as a straight rod and carefully walled-off on all sides before it is shelled off from the pelvic floor. Soiling is reduced to a minimum. Pelvic drains that emerge from the vagina should, if possible, be so placed that they do not come in contact with the small bowel. Vaginal drains laid in the pelvis during an abdominal operation should not be removed, as a rule, before the fourth or fifth day on account of the danger of pulling down an adherent loop of small bowel. No case of pelvic abscess should be irrigated. There is danger of rupture of the abscess wall and of the escape of infectious fluid into the abdomen which will set up a general peritonitis. Postpuerperal pelvic infections are found, as a rule, in one or both broad ligaments. Those in the broad ligament can be most satisfactorily opened extraperitoneally through a gridiron incision just above Poupart's ligament. Such accumulations should rarely, if ever, be opened through the vaginal vault.

107. **Hemolytic Jaundice.**—Seventeen cases of hemolytic jaundice, of which four are probably of the acquired type, are reviewed by Griffin. In twelve splenectomy was performed. An increased fragility of the erythrocytes in the peripheral circulation was a constant finding in all the fifteen patients tested. This increased fragility was found to persist at varying periods after splenectomy in seven of eight patients tested. The values for urobilin and urobilinogen in the duodenal contents were high in six patients in whom they were estimated. There was an appreciable fall in these values following splenectomy. In seven (58 per cent.) of twelve splenectomized patients gallstones were present. The removal of gallstones has not cured hemolytic jaundice. On the other hand, patients with hemolytic jaundice who were splenectomized have been cured of their jaundice and anemia though retaining the gallstones. Of the twelve patients on whom splenectomy was performed, ten are living; nine are in excellent health without jaundice or anemia. There was one operative death. One patient died four months after operation; another patient with a severe form of the acquired type of the disease was in excellent health for eighteen months, had a relapse after two years, and is again in fairly good health after two and one-half years following two transfusions. Four patients have been in excellent health for fourteen months, fifteen months, twenty-three months, and five and one-half years respectively.

110. **Webs and Pouches of Esophagus.**—Mosher records an original method of treating esophageal pouches by cutting the common wall between the pouch and the esophagus. It has worked well in three cases.

111. **Surgical Treatment of Banti's Disease.**—Lockwood says that experience thus far in splenectomy for Banti's disease would seem to justify the conclusion that overfunctioning of the spleen, whether of toxic or bacterial origin, is the cause of the anemia and liver changes so characteristic of the disease.

### Vermont Medicine, Rutland

*July, II, No. 7*

119 Infantile Paralysis. C. S. Caverly, Rutland.—p. 169.
120 Diagnosis and Medical Care of Mastoiditis. G. G. Marshall, Rutland.—p. 171.

## FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

### Medical Journal of Australia, Sydney

*June 16, I, No. 24*

1 Plea for Metric System. F. G. Griffiths.—p. 501.
2 War Surgery at Front. C. MacLaurin.—p. 503.
3 Control of Hemorrhage in Operation for Repair of Old Lacerations of Cervix Uteri. J. F. Mackenzie.—p. 505.
4 Generalized Scleroderma with Sclerodactylia. S. Jamieson.—p. 505.

*June 23, No. 25*

5 Experiences in Mesopotamia. R. M. Allan.—p. 523.
6 Fractures at Ankle Joint. H. R. Sear.—p. 526.
7 Cancer of Cervix Uteri Following Subtotal Hysterectomy. R. Worrall.—p. 530.

*June 30, No. 26*

8 Dr. Eric Pritchard's Theory and Treatment of Rickets. W. F. Litchfield.—p. 547.
9 *Case of Anemia of Pernicious Type in Infant. B. Bradley.—p. 549.
10 *Left-Sided Cecum and Ascending Colon with Absence of Transverse Colon. C. E. Corlette.—p. 551.

9. **Anemia of Pernicious Type in Infant.**—Bradley's patient was 11½ months of age. When the child was admitted it was a pale lemon color. There was puffiness of the face and swelling around the ankles. The abdomen was soft. The spleen was palpable an inch below the costal margin anteriorly, and the lower edge of the liver was felt ½ to 1 inch below the costal margin, both in the midline and to the right side. A blood count showed: red cells, 1,600,000; hemoglobin, 30 per cent.; leukocytes, 14,000. There was marked poikilocytosis, anisocytosis and polychromatophilia. Many microcytes and macrocytes were present. There were considerable numbers of nucleated cells, some of which were megaloblasts. Differential count: polymorphonuclear cells, 37 per cent.; mononuclear cells, 51 per cent.; eosinophil cells, 3 per cent.; large mononuclear cells, 4 per cent.; transitional cells, 5 per cent. The child was given liquor arsenicalis. Six months later the blood count showed: red cells (dupl.), 4,200,000; hemoglobin, 80 per cent. and leukocytes, 7,000. The red cells appeared normal. No nucleated cells were noted. (Giemsa) polymorphonuclear cells, 45 per cent. and mononuclear cells, 55 per cent. The child is still under observation.

10. **Left-Sided Cecum and Ascending Colon with Absence of Transverse Colon.**—A man, 30 years of age, had for years complained of various gastric symptoms and of constipation. The chief gastric symptom was flatulency after meals, but at times he had pain and excessive discomfort, relieved by washing out the stomach. The Roentgen ray disclosed a peculiar abnormality of the intestine. The cecum and ascending colon were to the left of the midline and ascended almost vertically to the splenic flexure, there being an absence of a good deal of colon.

### Bulletin de l'Académie de Médecine, Paris

*June 26, LXXVII, No. 26, pp. 797-826*

11 Regulation of Sale of Proprietaries. Committee report. Discussion.—p. 798. To be continued.
12 *"Trench Albuminuria." (Néphrites de guerre.) J. Teissier.—p. 806.
13 *Proportion between Male and Female Infants Born. (De la masculinité.) F. Maurel.—p. 811.
14 Reeducation for War Deafness. A. Castex.—p. 817.
15 Operative Treatment of Shell Wounds of the Lung. P. Duval.—p. 819.
16 Free School Clinics Needed to Supplement the Work of the Medical Inspector. F. Bussière.—p. 821.
17 Food Value of Barley. (L'orge dans le pain de guerre.) E. Weill and G. Mouriquand.—p. 824.

*July 3, LXXVIII, No. 27, pp. 1-12*

18 The Causes of Depopulation. F. Jayle.—p. 3.
19 *Mumps Meningitis. E. de Massary, Tockmann and Luce.—p. 6.
20 *Production of Urea in Tissues in Course of Necrosis, and Consecutive Azoturia. P. Ameuille.—p. 8.
21 Simplification of Technic for Transfusion of Blood. (La transfusion sanguine clinique: Technique hémosaline biveineuse mensuratrice sans anastomose.) G. Rosenthal.—p. 10.

12. **Trench Albuminuria.**—Teissier says that there is nothing specific about the kidney troubles of the men in the trenches except the high nitrogen content of the blood, from 0.7 to 1.35 gm., while the content in the urine is below normal, although the permeability of the kidneys seems unimpaired. The rarity of serious uremia is thus explained. The whole trouble seems to be from accumulation of waste products. This may entail a reflex spasmodic contraction of the bundle of His. This assumption seems to be the only plausible explanation of the peculiar characteristics of the first heart sound in these cases. None has ever proved fatal to date, and consequently anatomic proof is lacking.

13. **Excess of Boy Babies.**—Maurel compares the statistics for the birth rate of male and female infants in various European countries since 1865. The excess of boys is fairly constant at the same figure in most of the countries, but in France it has shown a gradual decline from 106-4 to 104-2 since 1806. The age of the parents seems to have an influence, the father predominantly; the younger the father the larger the proportion of boys, according to some figures published in Norway. Maurel's own research in a large town in the south of France, and elsewhere, showed that among the well-to-do the proportion was only 126 boys to 149 girls. The masculinity was thus only 84.5 per cent.; in other groups only 76. In a group of 100 gouty families there were 52 without children, and in the other 48 per cent. the masculinity was only 75. He does not cite figures in regard to syphilis, but it is his general impression that the surviving girls outnumber the boy babies.

19. **Mumps Meningitis.**—Massary, Tockmann and Luce found lymphocytic meningitis almost constant in their 635 soldiers with mumps since early in 1915. The sugar and albumin content of the cerebrospinal fluid was usually above normal. The constancy, intensity and long duration of the lymphocytic meningitis were in marked contrast to the clinical findings. Slowing of the pulse was the only constant and persisting symptom. No cerebral symptoms were noticed except in 23 per cent. of the cases, and they were transient, and there were no appreciable nervous sequels in any instance.

20. **Production of Urea in Tissues Undergoing Necrosis.**—Ameuille calls attention to the large output of urea when there is extensive suppuration and the patients are eating scarcely anything. In one such case the man took nothing but two glasses of milk per day, but he voided 32 gm. of urea per liter, a total of 40 gm. daily. Necrosis in large suppurating wounds on both legs evidently may induce the production of urea beyond the capacity of the kidneys to eliminate. In the aboye case the urea content of the blood also ran up, and symptoms of uremia developed.

### Paris Médical

*June 30, VII, No. 26, pp. 533-548*

22 *Elephantiasic Edema after War Wounds. Mériel.—p. 534.
23 Anesthesia of the Suboccipital Nerve as Sign of Fracture of the Posterior Arch of the Atlas. J. A. Sicard and H. Roger.—p. 540.
24 Abortive Epidemic Cerebrospinal Meningitis. H. Rendu.—p. 542.
25 Plan for Model Operating Pavilion. R. D. de la Rivière.—p. 543.
26 Periodic Eructation. R. Benon.—p. 544.

22. **Elephantiasic Edema.**—Eleven typical cases are related, with illustrations of two showing the permanent edema and pronounced decalcification of some of the bones of leg or hand following a war wound. The edema always stopped abruptly at a certain level, above which the limb was normal. This and other features of the cases suggested that a constricting band had been applied and that the resulting vascular disturbance had entailed the neuritis. The neuritis persists and may permanently incapacitate the man for active service. It is important therefore to cure the edema and prevent its factitious exaggeration. Mériel has found a plaster bandage, reaching to the root of the limb, the best means of prophylaxis. The factitious edema promptly subsides while the constitutional does not. In conclusion, he recalls Sicard's chronic segmentary edema as possibly proving misleading.

### Presse Médicale, Paris

*June 21, XXV, No. 35, pp. 361-368*

27 *Abortive Treatment of Typhoid. A. Mauté.—p. 361.
28 *Treatment of Fractures of the Femur. H. Judet.—p. 363.
29 Diagnosis of Scabies. (Comment diagnostiquer la gale quand on n'est pas dermatologiste.) R. Sabouraud.—p. 364.

*June 28, No. 36, pp. 369-376*

30 Causes and Frequency of Chronic Appendicitis. J. L. Faure.—p. 369.
31 *Rabies in Man. Jourdran and L. Marchand.—p. 371.
32 *Technic for Detection of the Ameba. P. Ravaut and G. Krolunitsky.—p. 373.

27. **Abortive Treatment of Typhoid.**—Mauté is treating typhoid on the principle of injecting a vaccine that has the most powerful modifying action on the body fluids along with the minimum of secondary toxic effects. Typhoid and paratyphoid bacilli are too toxic to be considered for the purpose. After long series of experiments on animals, he succeeded in finding a saprophytic microbe, isolated from spring water, which seems to be nontoxic for all laboratory animals by subcutaneous, intravenous and intraperitoneal injection. He used it in an emulsion made with thirty-six or forty-eight hour cultures, the dose from 100 to 500 millions. In 19 out of 23 typhoid patients thus treated, the temperature dropped abruptly in twenty-four hours to normal or below, and in 12 cases it did not go up again. The effect on the temperature is not so striking as the general benefit. The toxic symptoms subside, the headache, the stupor or delirium disappear. The tongue clears up and the diuresis increases. The pulse may keep high for several days and the diarrhea may persist, but the patient usually gets hungry within three days. There is a chill for ten or twenty minutes after the injection, but nothing at all alarming, no dyspnea nor dwindling of the pulse. Certain other saprophytes seem to display the same action on the organism, and it may yet be possible to isolate the active substance and inject this alone. His results were promising also with the same treatment applied in acute articular rheumatism and pneumonia. The facts observed seem to conflict to a certain extent with the generally accepted views as to specificity. But facts are facts, he declares, and those here related apparently open new horizons for the problem of immunity.

28. **Fracture of the Upper Femur.**—Judet advises continuous extension and a comprehensive plaster cast to combat the inevitable abduction of the upper fragment with subtrochanter fracture of the femur. Illustrations show the special features of fracture at this point. He warns that continuous extension incorrectly applied almost inevitably injures the functioning of the knee. Traction should be on the thigh alone with fracture of the femur, even if traction must be weak. It is better to have a thigh a little shorter than normal than to have a crippling knee.

31. **Rabies.**—In the six cases which developed under Jourdran's eyes, the incubation ranged from twenty-one to fifty-three days. Pasteur treatment was applied the same day the man had been bitten in one case; the fifth, seventh and ninth days in the cases of the three children. The other man had not had any treatment. The onset of the rabies was sudden and severe, in the midst of apparently perfect health. Any noise or the sight of a bright object, or a touch or taste sensation was liable to bring on the convulsions, but headache was rare. The fear of the light and of water comes from the remembrance of the convulsions started by the contact of water with the mucosa in the mouth or the sight of a bright object. This is the explanation of the origin of the term hydrophobia.

32. **Simplified Technic for Detection of Amebas.**—Ravaut says that if the amebas in the feces have still any vitality left, they can be started up to move about by heating the slide as it lies in the microscope. The flame of a match or of a small tampon dipped in alcohol and held under the slide will answer the purpose, or with a dentist's heated rubber bulb a jet of hot air can be directed on the under side of the slide. The cysts can be shown up best by impregnating them with a mixture of 0.5 gm. iodin and 1 gm. potassium iodid in 50 gm. distilled water. If feces are treated with a 5 per cent. solution of liquor formaldehydi the cysts keep well for months. He puts 5 c.c. of this solution in a test tube with a lump of feces about the size of a pea. The tube is plugged with nonabsorbent cotton, and it is shaken up until the contents are well mixed. They will keep then for months and the cysts show up clearly.

## Progrès Médical, Paris

*June 30, XXXII, No. 26, pp. 217-224*

33 Oscillometry in Diagnosis and Prognosis of Obliteration of Artery. P. Balard.—p. 217. To be continued.
34 Paraffin Film in Dressing the Eye. (Pansements oculaires à l'Ambrine.) L. Dubar.—p. 218.
35 Ambulance for Optometry. Ginestous.—p. 221.
36 The Baths of Caracalla at Rome. A. Satre.—p. 222.

## Correspondenz-Blatt für Schweizer Aerzte, Basel

*June 23, XLVII, No. 25, pp. 785-816*

37 *Kidney Stones and Operative Treatment. (Nierensteine.) F. Suter.—p. 785.
38 *Operative Treatment of Tuberculous Peritonitis. (Tuberkulöse Bauchfellentzündung.) S. Stocker.—p. 800.
39 No Diagnostic Value in Thermoprecipitin Reaction in Gonorrhea. B. Galli-Valerio.—p. 805.

37. **Nephrolithiasis in Switzerland.**—Statistics published seven years ago apparently demonstrated that urinary calculi were becoming more frequent in Switzerland. Lardy published further statistics in 1911 which showed the increasing consumption of meat, especially mutton, in the country, and he attempted to connect these two facts. As the supply of meat, and above all of mutton, has been cut down so low since the war began, it may be possible that urinary stones may become less frequent. Suter here relates that during the years from 1900 to 1905, when he was assistant to a prominent surgeon at Basel, he never encountered any cases of kidney stones, but since then, during his own practice there he has had thirty-four operative cases of nephrolithiasis. In sixteen cases the calculi were of the calcium oxalate type, in twelve the phosphate or carbonate type, and five were urate calculi. The latter were always small, but by plugging the ureter they compelled operative treatment. They were always infected, so that it seems as if they must have been secondary to some infectious process. Urate stones are more readily washed along than others, and require operative measures only when one becomes impacted in the ureter. Oxalate stones induce symptoms early, so that they are found small and easily removed by pyelotomy. Phosphate stones on the other hand develop insidiously to such a size that nephrotomy or nephrectomy is usually required for them. In his operative cases of nephrolithiasis there was very rarely a history of preceding colics. One patient had twenty-nine stones, with a total weight of 116 gm. in one kidney and a single stone weighing 90 gm. in the other, but they were only casually discovered, as the urine persisted turbid after cure of the cystitis which had brought the man of 61 to the physician. In one case after a brief period of pain in the right kidney, pains developed in the left kidney, very severe and protracted, and later in the bladder. After removal of a stone in the right kidney there were no further pains.

With hydronephrosis, the stones float around; in one such patient the outlet became plugged with the stone as he stood, but it evidently floated away as he reclined. Infected stones did not cause any more intense subjective disturbances than the aseptic. Kidney stones can rarely be palpated, but the urine is never normal. If the microscope fails to show any red corpuscles on repeated examination, the probabilities are against nephrolithiasis. Among his thirty-four kidney-stone cases, four of the patients had a single kidney and two succumbed to the results of the total anuria for several days, rallying only temporarily after the operation. The third recovered, as also the fourth after a secondary operation. The fact that no urine is voided does not alarm; the patients apply for relief only when driven by pains. The prognosis with pyelolithotomy is good. With anuria the prognosis depends on its duration, as a rule.

38. **Operative Treatment of Tuberculous Peritonitis.**—Stocker remarks that the time and money spent for a course of heliotherapy in the mountains often goes for naught as, after return to the old environment, the tuberculous peritonitis flares up again. The same is true also of courses of radiotherapy. The peritonitis is extremely rarely the primary localization of the disease. Schlimpert found that 89.9 per cent. of the patients dying with tuberculous peritonitis succumb in reality to tuberculous lesions elsewhere. Stocker had one patient with tuberculous peritonitis and a

slight apical process. She would not consent to the abdominal operation he proposed, and succumbed two years later to the progressive pulmonary process, which had come to entirely overshadow the peritoneal process. On the other hand, he has cured twelve out of fifteen patients and materially improved the others by operative treatment. There was recurrence several years later in the fifteenth case. None has died. Through a median laparotomy he dabs the entire accessible surface with the official tincture of iodin, loosening up adhesions only as necessary to reach all the surface. If necessary for this, he does not hesitate to make a second incision. Adhesions have to be handled very carefully not to tear the bowel or burst a suppurating gland. Tuberculous tubes or ovaries were removed if readily accessible and the general condition permitted. In two cases the appendix was removed. The abdominal wall was always sutured at once; it healed by primary intention in all but the one case in which a suppurating gland burst and an abscess followed in the abdominal wall. In preparation he gave saline infusion, digitalis and camphor. The general aspect improved at once and the patients left the hospital on an average by the seventeenth day. All symptoms subsided and the abdomen felt soft, and any lung processes seemed to share in the benefit.

His cases were all of the dry adhesive form of tuberculous peritonitis and yet all were cured from the subjective standpoint. He ascribes the benefit to the hyperemia induced in the peritoneum. The blood pouring in brings the antibodies which induce retrogressive changes in the tubercles. This is followed by proliferation of connective tissue. The degree of afflux of blood seems to decide the outcome, and hence the iodin is used to enhance the hyperemia. He experimented first with rabbits, and found that a chronically inflamed peritoneum does not absorb the iodin like a sound organ. In the rabbit, the iodin often prevented the development of tuberculosis after inoculation and led to the healing of recently established infection. Hofmann in four (1912), and Falkner in three cases (1913) reported equally favorable results. The interval since has been over one, three or four years in all but three of Stocker's fifteen cases. There was no mortality in the total twenty-two cases.

### Gazzetta degli Ospedali e delle Cliniche, Milan

*May 27, XXXVIII, No. 42, pp. 625-639*

40 Military Hygiene in the Present War. A. Secchieri.—p. 625.

*May 31, No. 43, pp. 641-648*

41 *Lumbar Puncture in Treatment of Wounds of the Skull. G. Lerda.—p. 643.

41. **Spinal Puncture after Skull Wounds.**—Lerda cites a number of writers whose experience with lumbar puncture to relieve pressure on the brain after war wounds has been extremely favorable. He has applied this measure himself over a hundred times, noting the spontaneous subsidence of hernia of the brain after lumbar puncture. This insured better conditions for natural drainage of the wound in the skull. No endocerebral drains are necessary when lumbar puncture is repeated as the exposed brain tissue becomes congested and turgid. Even when the effect on the brain hernia is less evident, yet the influence of repeated lumbar puncture seemed to be always favorable. In some cases it was repeated on alternate days ten or twelve times, or even daily, withdrawing 20 or 40 gm. of fluid, with benefit beyond all hopes.

### Policlinico, Rome

*July 1, XXIV, No. 27, pp. 841-872*

42 *Typhoid in the Vaccinated. S. Minelli.—p. 841.
43 Vaccination against Typhoid. T. Silvestri.—p. 846.
44 Alveolar Pyorrhea. B. de Vecchis.—p. 848.
45 Plant instead of Animal Albumin in Culture Mediums. M. Mitra.—p. 853.

*June, Surgical Section No. 6, pp. 233-272*

46 *Paraffin Film Treatment of Wounds and Frostbite. G. Masnata. —p. 233; G. Matronola.—p. 248.
47 *Trench Foot. U. Tassone.—p. 254.
48 Femoral Hernia. G. Serafini and A. Carle.—p. 264. Continuation.

42. **Camp Typhoid.**—Minelli analyzes the various peculiar features of typhoid occurring in men who had been vaccinated against the disease, comparing them with the course in the nonvaccinated. In 77 per cent. of 74 vaccinated, the disease was very mild, while this was the case only in 27 per cent. of 63 nonvaccinated. In 400 cases there was agglutination for typhoid bacilli in 69 per cent., for paratyphoid A in 20, and B in 11 per cent. The mortality among the vaccinated was 5.3 per cent.

46. **Paraffin Film Treatment.**—Masnata reports considerable experimental and clinical study of the paraffin film treatment of wounds. He says that his work has apparently confirmed that the film method is an advance, but that the paraffin alone (melting at 50 or 52 C.) is the sole essential element. No other ingredients are required, as his charts recording the results of parallel tests show that plain paraffin protects and retains its heat practically the same as the proprietary mixtures.

Matronola concludes from the few cases in his experience that film treatment may be useful for sterile war wounds, for frostbite of the second degree and for the granulations left by the eschar from those of the third degree.

47. **Trench Foot.**—Tassone's research on the prophylaxis of trench foot showed that standing still was the main factor in the development of the trouble. The gravest cases did not come from the wettest and coldest trenches, but from those where the men were unable to move about. When relieved from such cramped positions special care should be taken to start the circulation in the feet. He advises for this prolonged soaking in warm water with massage. As numbness is about the earliest symptom of trouble, the men do not realize that anything is wrong until the condition is quite far advanced. Consequently, effectual prophylaxis of trench foot requires daily medical inspection of the feet when conditions predispose to it. Since this has been the rule the cases have been detected in their incipiency. Smearing the feet often with grease not only protects them and keeps in the heat, but it softens the edges of stiff leather.

### Riforma Medica, Naples

*June 16, XXXIII, No. 24, pp. 629-648*

49 *Bacterial Nucleoproteids. A. Ferrannini.—p. 629.
50 *Surgical Treatment of Tuberculous Peritonitis. V. Ruffo.—p. 636.

*June 23, No. 25, pp. 649-668*

51 *Traumatic Reflex and Hysteric Paralysis. L. Ferrannini.—p. 649. Commenced in No. 24, p. 632.
52 *Sycosis from Uricacidemia. C. Vignolo-Lutati.—p. 652.
53 War Wounds of Limbs. S. Salinari.—p. 654. To be continued.

49. **History of Bacterial Nucleoproteids.**—Ferrannini relates that no sooner had nucleoproteids been discovered than Galeotti and Lustig, of the Florence Pathologic Institute, sought and found them in the bodies of bacteria and applied the data thus learned in preparation of antiplague vaccine. Galeotti spent some time at Bombay in the work, and the Galeotti-Lustig antiserum was selected by the Bombay public health authorities as more effectual than the Haffkine, Yersin, Pasteur Institute or Petrograd antiserums.

50. **Surgical Treatment of Tuberculous Peritonitis.**—Ruffo reviews the history of surgical treatment of tuberculous peritonitis and reports the ultimate outcome in cases at a Naples hospital. The cure has been complete to date in three cases in which laparotomy had been done in 1894, four in 1896, and others later. One young woman had her abdomen opened four times in 1895 before the disease was conquered. She now has long been in apparently perfect health. Another patient was a young woman, and at the laparotomy 6 liters fluid were withdrawn, and the cavity was flushed copiously with 5 per cent. boric acid solution. Recovery was hindered by collapse, rebellious diarrhea and an eruption resembling measles — probably the result of toxic action from the boric acid solution in such large amounts. Recovery was soon complete and durable. In another case 15 liters of fluid were withdrawn at the laparotomy and the cavity was flushed with 1 per thousand mercuric chlorid solution, sponged dry afterward, and then flushed with boiled water at 40 C. (104 F.). The patient soon left the hospital in good condition. Opinions differ as to the actual curative factors in such cases. D'Urso regards the flushing out of the abdominal cavity as one of the most important factors, as it facilitates the elimination of toxins. He thinks that the peritoneum gets enough irritation to modify it without the necessity for an irritating

chemical. A 3 per cent. solution of boric acid or physiologic saline seems all that is necessary. In the diffuse purulent form the simplest measures are best. The only contraindications he admits are advanced pulmonary lesions or involvement of other viscera.

51. **Traumatic Reflex or Hysteric Paralysis.**—In two cases of which an illustrated description is given, a bullet wound of the forearm, without direct injury of bones or of the nerves of the muscles involved, was followed by lax paralysis with hypo-esthesia and amyotrophy, no electric but considerable mechanical hyperexcitability, and slight circulatory disturbances. The hand drooped at an acute angle and the visual field was contracted. The disturbances are purely functional and correspond to Babinski's reflex paralysis, but they correspond also to hysteria paralysis, and Ferrannini is convinced that they belong in the hysteria class and that there is no need to set up this new category of "reflex paralysis."

52. **Uric Acid Sycosis.**—Lutati says that among his seventy cases of idiopathic sycosis during a recent five-year period, there were signs of uricacidemia in forty-two. There seemed to be a primary amicrobian phase in the process, a deep perifollicular dermatitis probably of endogenous origin. When infection became superposed, the resulting lesions ranged from simple folliculitis to furuncles. He suggests that alveolar pyorrhea may have a similar origin. Be this as it may, treatment of the sycosis on the assumption that it was a manifestation of the diathesis of sluggish elimination rapidly improved conditions, even without direct treatment of the sycosis.

### Tumori, Rome

*April-May, V, No. 2, pp. 129-228*

54 *Cystic Disease of the Suprarenals. V. Saviozzi.—p. 129.
55 Melanotic Sarcoma of the Choroid. R. Desogus.—p. 148.
56 Pathologic Anatomy and Clinical Results of Resection of the Stomach. G. Fichera.—p. 156. To be continued.
57 Action of Fresh or Autolyzed Spleen Tissue on Grafting and Further Development of Experimental Tumors. G. D'Agata.—p. 200.

54. **Cystic Disease of the Suprarenals.**—Saviozzi reports a case of a cyst in the left suprarenal capsule as large as the head of an adult. He says it is the seventeenth on record and the ninth operative case. The patient was a man of 76, and the first signs of trouble had been noticed two years before. The clinical picture resembled that in a case that had been in the clinic a short time before in which a blood cyst in the spleen had been responsible for the symptoms. The present patient had complained of dizziness at times, but there was no tendency to sudden pallor or swooning. Four liters of bloody fluid were evacuated from the cyst which was found to be in the left suprarenal capsule. It was adherent to the spleen and diaphragm. The kidney was removed with the cyst, the kidney forming merely a kind of appendix to it. The operation was two hours long, but under spinal anesthesia the elderly man bore it well, although he presented severe advanced arteriosclerosis with edema of the legs and considerable ascites. In the nine operative cases on record, three died of the four treated by suturing the cyst to the skin, and two of the five treated by enucleation of the cyst.

### Revista Clinica, Medellin, Colombia

*March, I, No. 4, pp. 142-199*

58 *The Physician Must Refrain from Doing Harm. F. A. U. Mejia.—p. 146.
59 *Probable Phlebitis of Inferior Vena Cava in Parturient. B. Mejia.—p. 148.
60 *Pituitary Treatment in Obstetrics. N. Jimenez.—p. 149.
61 Surgery of the Bile Passages in Colombia. G. J. Gil.—p. 170; G. Gomez.—p. 186.
62 Electric Treatment of Inoperable Epithelioma in the Inside of the Cheek. V. T. Echeverri.—p. 191.

58. **Primum non Nocere.**—Mejia says that in our efforts to relieve suffering we are liable to forget Hippocrates' admonition. It is our duty to relieve the pain of labor, but we should not do this at the expense of injury to the mother or child. The end does not justify such means. He quotes authorities that the only reliable means to reduce the pains of childbirth is with chloroform *à la reine*, after careful exclusion of contraindications. Even this, he adds, is not free from dangers and inconveniences. But the preparations recently advertised for the purpose, partoanalgin, tocanalgin, eutocin, lucin and others of this stamp all contain morphin, and each of them has mishaps to its discredit involving the mother and intoxicating the infant to such a degree as to prove frequently fatal. "We should not countenance measures that are inherently dangerous, even to do good with them. Civilization does not sanction our knocking a man down and taking his money even if we give the money to a beggar and we know that it will be spent to relieve much need."

59. **Phlebitis of Inferior Vena Cava.**—The young and otherwise healthy woman had phlebitis of the left femoral vein at her fourth childbirth. When the fifth child was born there was femoral phlebitis first on one side and then on the other. After both had subsided, rigors and prostration developed suddenly, with intense tenderness and acute pain in the right iliac fossa. The pain gradually spread to include the spine up to the thorax, any touch or movement causing agony. After two weeks of suffering the fever subsided and recovery slowly followed, the anemia and asthenia persisting for a long time. Phlebitis of the inferior vena cava seems the only assumption that would explain the symptoms observed.

60. **Pituitary Extract in Obstetrics.**—Jimenez describes a few maternity cases in which he used pituitary extract, and relates his impressions as to the availability of this treatment. He declares roundly that it should never be used with a normal delivery. Watchful waiting is the science of the obstetrician, active in its passiveness. He quotes that attempts to hasten labor with pituitary extract are "useful only for the accoucheur and possibly also for gynecologic specialists later." Also that pituitary treatment is never required in a normal childbirth with a normal woman. In one case he was summoned to a woman who had been in labor several hours. All seemed to be normal and he wished to leave as he had other important duties. The family would not consent to his departure, and to hasten matters he gave pituitary extract. Delivery occurred at once, but the deeply asphyxiated child required an hour and a half of active measures before he could safely leave it. If the mother had had hemorrhage or other complication requiring attention, he could not have saved the child. In conclusion, he lists nine formal contraindications against the use of pituitary extract in obstetrics: It should never be given when there is the slightest fear of rupture of the uterus or signs that the fetus is already suffering. It is also irrational with shoulder presentation and in most cases of pelvic presentation. It is also contraindicated in elderly primiparae with rigid perineum. He has seen in such cases that even two or three injections failed to induce any effect, while, on the other hand, the extract is very dangerous under these conditions for the fetus and for the maternal soft parts. It is also contraindicated before the cervix is fully dilated; the cervix may be torn off completely if not fully dilated. Secondary inertia is also a contraindication, when the uterus has wasted its contractile energy against some obstacle which it has been unable to overcome, as with contracted pelvis, tumor, rigid cervix, etc. If the obstacle is unsurmountable, giving pituitary extract may entail the rupture of the uterus or the action of the extract may lead to increased inertia, or the head may be finally expelled but with the application of such force that brain or meningeal hemorrhages soon prove fatal.

### Revista de Medicina y Cirugia de la Habana

*July 10, XXII, No. 13, pp. 321-346*

63 Present Status of the Treatment of Syphilis. V. P. Castello.—p. 321.
64 *Strangulated Hernia. E. Stincer.—p. 338.

64. **Strangulated Hernia.**—Stincer's fifteen cases included one with intestinal hemorrhage and two with paralytic occlusion, fatal in one case. He condemns absolutely all attempts at taxis, and urges immediate incision and evacuation of the contents of the loop if there is the slightest doubt as to its vitality. Pneumonia followed the operation in three cases, probably the work of the ether superposed on the septic intoxication from the gangrenous lesions in the bowel. In one case the inguinal hernia was of the retrograde or W type.

### Semana Medica, Buenos Aires

*May 17, XXIV, No. 20, pp. 563-590*

65 Evolution of Obstetrics in Argentina. E. Zarate.—p. 563.
66 *Examination of Lungs of Recruits. J. A. Lopez.—p. 569.
67 Lymphocytosis in Syphilitics. C. P. Mayer and A. C. Gourdy. —p. 575. Continuation.

*May 24, No. 21, pp. 591-614*

68 Research on Lactic Acid Bacteria. E. Fynn.—p. 591.
69 Suppurating Phlegmon of Dental Origin Extending from Mouth to Upper Thorax. I. Justiniano.—p. 594.
70 History of Public Hygiene in Argentina; Autobiography. E. R. Coni.—p. 595. Continuation.

66. **Detection of Tuberculosis in Recruits.**—Lopez comments on the high percentage of cases of pulmonary tuberculosis in the Argentine navy, and urges greater care in the selection of recruits so as to eliminate the tuberculous. He remarks that when the conscription officer and the examining physician find large numbers of unfit, the former grows nervous for fear he may not be able to make up the quota for his district. In spite of himself, this nervous apprehension becomes imparted to the examining physician, and the latter is unconsciously influenced by it and his judgment as to the compliance with the requirements for service becomes warped. This is a common psychologic phenomenon, but in its influence on the acceptance of recruits it may have disastrous consequences not only for the man himself, but for the state. The tubercle bacilli locate first in the glands at the hilus, as a rule, and attack the lower lobes oftener than the regions above, usually on the right side. But the tuberculous process here encounters so many obstacles that it develops slowly or may heal. In examining recruits this is the first point to be investigated, the hilus, the region around it and the base. In Lopez' extensive experience he has found an isolated tuberculous process at the apex only in a very few cases. Roentgen examination is indispensable in dubious cases to reveal tuberculous glands at the hilus, especially when the general constitution seems to be below par. Pignet's index of robusticity is a great help but the measurements for it should always be taken with uniform technic.

### Siglo Medico, Madrid

*June 23, LXIV, No. 3315, pp. 445-464*

71 Dermoid Tumor on the Eyelid. B. Castresana.—p. 446.
72 Neuralgia and Neuritis in Syphilitics. Sicilia.—p. 449.
73 Peptic Ulcer. L. Urrutia.—p. 449. Continuation.
74 Importance of Diathermy in Gynecology. Poblacion.—p. 458. Conclusion.

### Grèce Médicale, Athens

*XVIII, No. 19-20, pp. 37-40*

75 *Heliotherapy for Nodose Erythema. J. Cecicas.—p. 37.

75. **Heliotherapy for Nodose Erythema.**—Cecicas says he has only three cases to report, but the heliotherapy was so promptly successful in them that he thinks its action must be regarded as specific. In none of the patients were there other indications of tuberculosis, but the disease was present in the families. Cecicas accepts Landouzy's theory that nodose erythema in a large proportion of the cases is a manifestation of tuberculous bacillemia. This assumption is justified further by the efficacy of heliotherapy. As the morbid cells are destroyed under its influence, antibodies are generated which act from within on nodules remote from the exposed areas. They retrogressed along with the exposed ones. In one of his cases iritis developed in the course of the treatment. The second eye became affected two months later. This patient was a woman of 56 and the nodose erythema had first appeared eight years before. The other patients were a woman of 27 and girl of 12. There has been no recurrence during the months to date.

### Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

*May 26, I, No. 21, pp. 1703-1782*

76 *Injurious Action of Optochin on the Organ of Vision. J. van der Hoeve and W. H. Mansholt.—p. 1710.
77 Anilin Dyes in Treatment of Wounds. (Wondbehandeling met pyoctaninum caeruleum.) T. M. Mesdag.—p. 1716.
78 *Traumatic Closure of Outer Ear Passage; Two Cases. P. T. L. Kan.—p. 1719.
79 *Present Status of Our Knowledge of Typhus. H. Aldershoff.—p. 1726.

76. **Optochin Visual Disturbances.**—In the case described, the previously healthy young man with pneumonia, on an exclusive milk diet, was given optochin in moderate doses (200 mg. six times a day) to a total of 4 gm., when he became totally blind. Vision partially returned later, but with paralysis of accommodation, atrophy of the optic disk and sclerotic changes in the vessels. The impairment of vision was so severe that he was unable to resume his work as bargeman. W. Hess, in 1915, found records of disturbance of vision in 6 per cent., and Uhthoff, in 1916, in 3 or 4 per cent. He found Marchi degeneration of the nerve tissue in two cases in which death had followed soon after the optochin had been taken. In the case here related the vascular changes did not develop until several weeks after the first symptoms, but they continued a progressive course while the nerve changes seemed to show a tendency to retrogress.

78. **Traumatic Occlusion of the Auditory Canal.**—Kan obtained good results with Trofimow's technic, cutting perpendicularly through the atresia and then, with an incision back to the ear, turning the outer ear over forward, thus obtaining access to the obstructed portion of the meatus. The obstructing bone or connective tissue was then chiseled out.

79. **Typhus.**—Aldershoff remarks that the occurrence of a few cases of typhus at Amsterdam has made this one of the burning topics of the day in Holland. He does not regard it as proved that transmission of the disease occurs exclusively by lice. He reiterates that treatment can be only symptomatic.

### Hygiea, Stockholm

*June 16, LXXIX, No. 11, pp. 513-576*

80 *Cyst of the Common Bile Duct. E. Waller.—p. 513.

80. **Cyst in Bile Duct.**—Waller has found records of 34 cases of an idiopathic cyst of the common bile duct, and gives a summary of each. Operative treatment was applied in all but 5 of the cases. He also refers to a number of cases of cystic dilatation, but some tumor, calculus, or chronic inflammatory process was responsible in this group. The diagnosis was never made in advance, the presumptive diagnosis being pancreas or echinococcus disease or an abscess in the liver. The trouble might have been differentiated, however, from the recurring attacks of pain in the children or young adults, usually accompanied with jaundice and fever, and the development of a cystic tumor fluctuating in size, in the right hypochondrium, not corresponding to the gallbladder. Among the 34 cases summarized there were 14 girls to 5 boys. In 21 cases a fistula was opened into the cyst. These patients all died from the loss of bile, or the icteric afterhemorrhage, or from infection. One young man survived for three years with his fistula, succumbing finally to pulmonary tuberculosis. One girl of 18 died three months later from fulminating hemorrhagic purpura. In 3 other cases an attempt was made to open a communication between the common bile duct and the bowel, but all terminated fatally, as also in 3 in which the sac was removed.

Only 5 of the total 34 patients recovered. In 3 of the successful cases, after a primary fistula had developed, an opening was made from the cyst into the bowel. Three operations were required in one of the cases. In two other cases a side-to-side communication between the bile duct and the duodenum was successfully made. One of these cases is reported by Waller in detail from his own service. The other was published by Bakes in 1907. Both patients were in apparently perfect health one and two years later. The necropsy findings in the fatal cases are summarized. Waller's patient was a girl of 10, who had had several attacks of abdominal pains every year during the last seven years. The operation was done after three days of acute pains, vomiting and a subicteric tint of the sclerotics; the urine was bile colored; pulse 100; temperature 38.1 C., and there was a large tender resistance in the right hypochondrium. When the abdomen was opened, the elastic retroperitoneal tumor was assumed to be a hydronephrosis. It burst during the maneuvers and clear dark green bile escaped. Prompt recovery followed the choledochoduodenostomy.